332

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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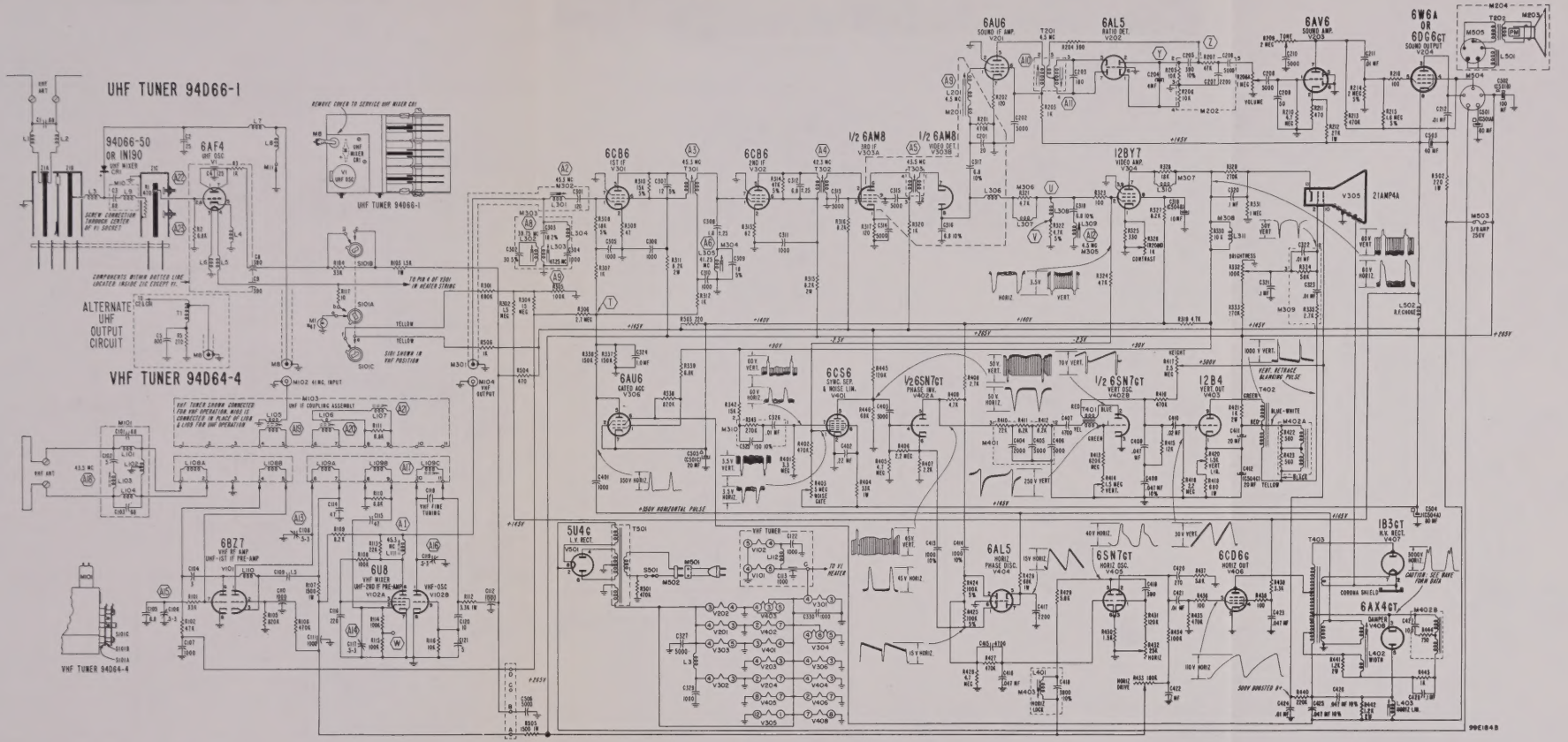
Hollicrafters, ADMIRAL RCA-Victor

10 82-108C (ch. A1C 1200A - Revs 1, 1A) Service
Chassis 21ABZ "
21-T- 7112 U., 7113U, 7117U, 7152U, 7153U, 7157. (Chassis KCS98A)

21-T- 7352, 7355, 7357 (Chassis KCS98E)


UHF TUNER 94D66-1
94D66-50 OR IN190
6AF4
UHF TUNER 94D66-1
ALTERNATE UHF OUTPUT CIRCUIT
VHF TUNER 94D64-4
6BZ7
6U8
VHF TUNER 94D64-4
6CB6
1ST IF V301
6CB6
2ND IF V302
1/2 6AM8
3RD IF V303A
1/2 6AM8
VIDEO DET V303B
6AU6
SOUND IF AMP V201
6AL5
RATIO DET V202
6AV6
SOUND AMP V203
6W6A OR 6DG6GT
SOUND OUTPUT V204
12BY7
VIDEO AMP V304
21AMP4A
6AU6
GATED AGC V306
6CS6
SYNC. SEP. & NOISE LIM. V401
1/2 6SN7GT
PHASE INV. V402A
1/2 6SN7GT
VERT. OSC. V402B
12B4
VERT. OUT V403
5U4G
L.V. RECT.
6AL5
HORIZ PHASE DISC. V404
6SN7GT
HORIZ OSC. V405
6CD6G
HORIZ OUT V406
1B3GT
H.V. RECT. V407
6AX4GT
DAMPER V408
Admiral Chassis 21A3BZ
Schematic Diagram Courtesy of Admiral Corp.

Schematic Diagram Courtesy of The Hallicrafters Co.

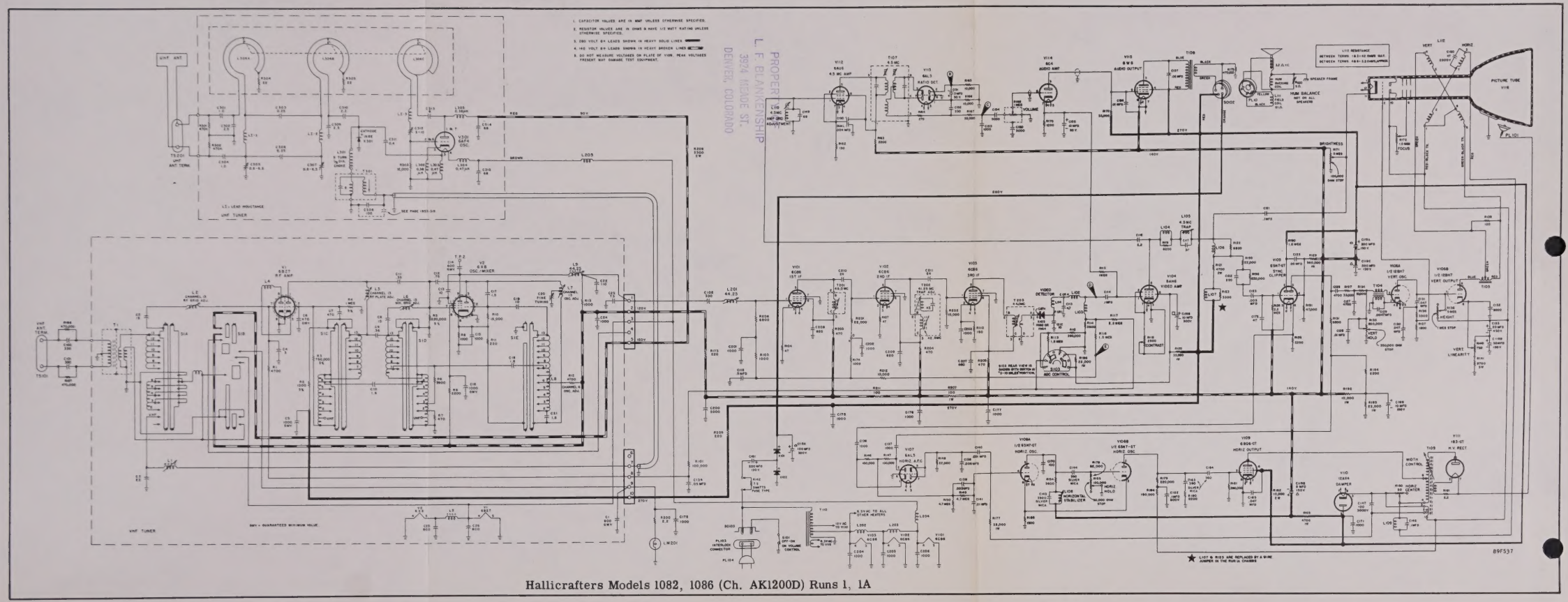
The PHOTOFACT Servicer

Vol. 34
Sets 331 & 332

★ *Published for all users of Howard W. Sams' Photofact Folders* ★

Oct. 1, 1956

The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.



Hallicrafters Models 1082, 1086 (Ch. AK1200D) Runs 1, 1A

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 14 IN SET 313

WESTINGHOUSE MODELS H-24K130, H-24KU130, H-934T21, H-934TU21, H-935T21, H-935TU21, H-938K21, H-938KU21, H-939K21, H-939KU21, H-941K21, H-941KU21, H-942K21, H-942KU21, H-950T24, H-950TU24, H-951T24, H-951TU24, H-954K24, H-954KU24, H-955K24, H-955KU24, H-956K24, H-956KU24 (Ch. V-2342-14, -24, -34, -44, V-2343-14, -24, -34, 44, V-2352-104, -204, -304, -404, V-2353-104, -204, -304, -404)

Westinghouse models H-934T21, H-934TU21, H-935T21, H-935TU21, H-938K21, H-938KU21, H-939K21, H-939KU21, H-941K21, H-941KU21, H-942K21, H-942KU21, H-950T24, H-950TU24, H-951T24, H-951TU24, H-954K24, H-954KU24, H-955K24, H-955KU24, H-956K24 and H-956KU24. (Ch. V-2342-14, -24, -34, -44, V-2343-14, -24, -34, -44, V-2352-104, -204, -304, -404, V-2353-104, -204, -304, -404) were covered in Photofact Folder 14 — Set 313.

Models H-24K130 (Ch. V-2343) and H-24KU130 (Ch. V-2353) are added, along with late production changes, with the publication of this bulletin.

Ch. V-2342, V-2343, V-2352, V-2353

NEW VHF TUNER

In late production tuner #473V003M01 is incorporated. A schematic of this tuner is given in Fig. 1.

Ch. V-2342, V-2343

TO IMPROVE VERTICAL SWEEP

A compressed band across the screen which may move slowly upward or downward or remain stationary is eliminated by replacing V7, AGC Keying-vertical multivibrator, and V11, vertical multivibrator - vertical output, tube sockets with mica filled sockets.

TO IMPROVE HORIZONTAL SWEEP

In order to eliminate horizontal weaving V13, horizontal multivibrator, tube socket was changed to a mica filled socket.

TO PREVENT OSCILLATOR RADIATION

All leads connecting to the tuner are shielded by a flexible metal shield.

SYNC SEPARATOR TUBE

A 3CS6 or a 3BY6 sync separator tube may be used. Both tubes are directly interchangeable.

NEW CATHODE-RAY TUBE

In later production, V17 is a 21ALP4A/B and is directly interchangeable with the 21ALP4A.

IF CIRCUIT REVISED

L22, 1st. video IF and L23, 2nd. video IF have been changed in chassis coded 119. A partial schematic showing the revised circuit is given in Fig. 2.

COMPONENT CHANGE

The printed circuit (C41 and R35) has been replaced by individual components.

TO REDUCE VIDEO RINGING

L25 is removed from the circuit and is replaced by a buss wire 1 1/8" in length.

TO IMPROVE BRIGHTNESS LEVEL

A .0047MFD @ 1.4KV capacitor is added from pin 10 of V17 to ground.

Ch. V-2342-64, V-2343-64, V-2352-604, V-2353-604

NEW SWEEP COMPONENTS

T1, horizontal output transformer, is changed to part #493V001M01.

T3, deflection yoke is changed to part #759V007M01.

With the above changes, the horizontal output circuit is revised. A partial schematic showing the revised circuit is given in Fig. 3.

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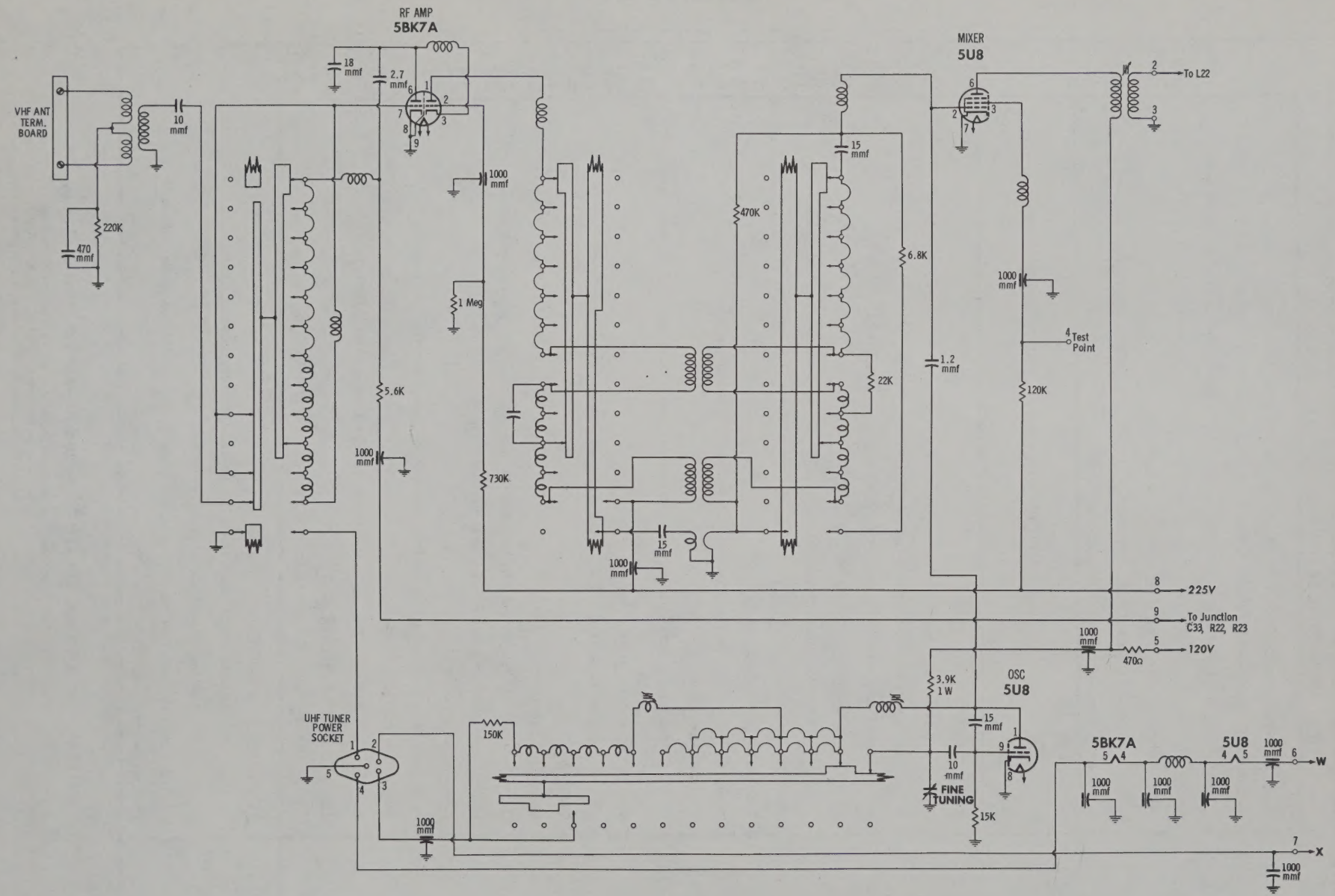

RF AMP
5BK7A
MIXER
5U8
VHF ANT TERM. BOARD
10 mmf
220K
470 mmf
18 mmf
2.7 mmf
1000 mmf
1 Meg
5.6K
730K
470K
15 mmf
6.8K
1.2 mmf
22K
120K
Test Point
To L22
225V
To Junction C33, R22, R23
120V
470Ω
OSC
5U8
3.9K 1W
UHF TUNER POWER SOCKET
150K
FINE TUNING
15K
5BK7A
5U8
W
X

FIG 1

Ch. V-2352, V-2353	PILOT LIGHT ADDED A #47 pilot lamp in series with a thermal resistor, 500Ω cold and 85Ω hot, 2 watt, is wired in parallel with R96.

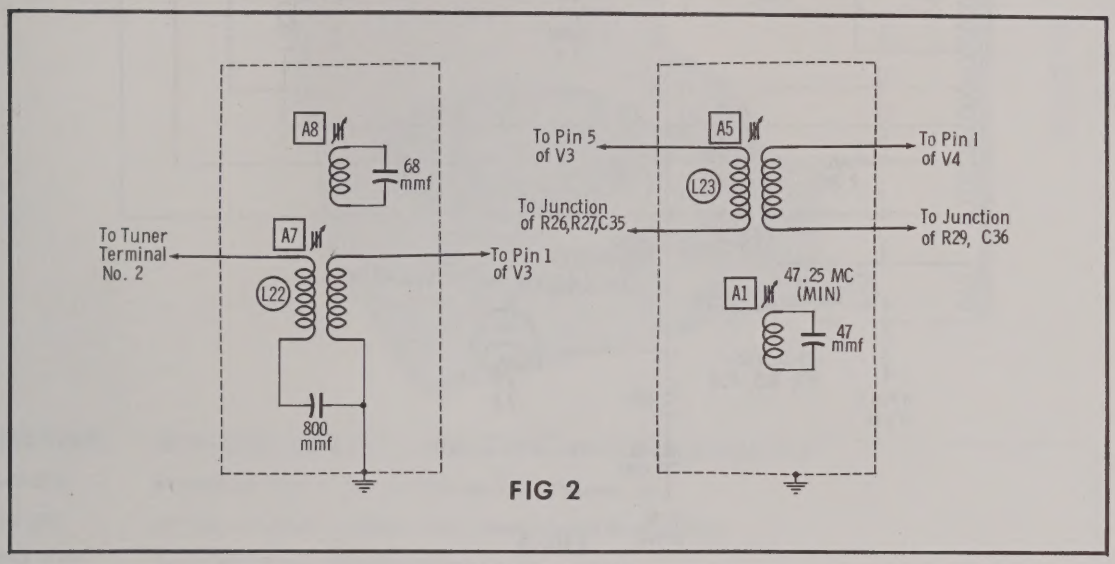


FIG 2

(Con't on reverse side)

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 10 IN SET 284	
	Mopar models 832 (P-5506) and 835 (C-5509) were covered in Photofact Folder 10 — Set 284. The following changes were made during late production.
Code 121, Run 4	TO REDUCE NOISE R4 is increased from 330Ω to 560Ω.
Code 122	NEW CONVERTER TUBE V2 is changed from a 6BE6 to a 6AU6. A partial schematic showing the new circuit is given on the reverse side. COMPONENT CHANGES R4 is decreased from 330Ω to 220Ω. R3 is omitted. C3 is decreased from 22MMF to 5MMF. R5 is increased from 10K to 18K. R7 is decreased from 330Ω to 220Ω. R8 is increased from 27K to 47K. R9 is increased from 22K to 47K. L4, oscillator coil, is changed to part #32-4641-3. L5, input IF, is changed to part #32-4160-18A.

MOPAR MODELS 832 (P-5506), 835 (C-5509)

(Con't on reverse side)

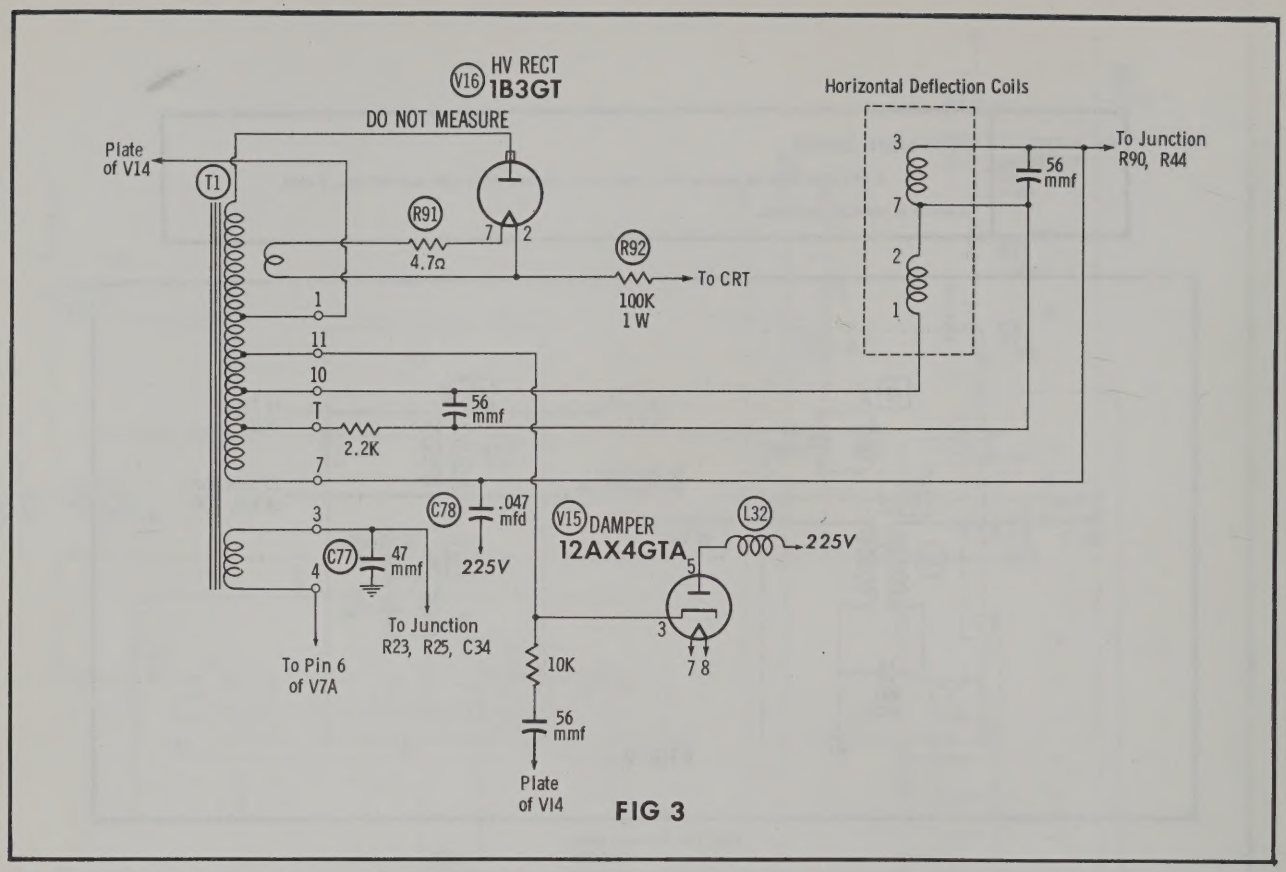
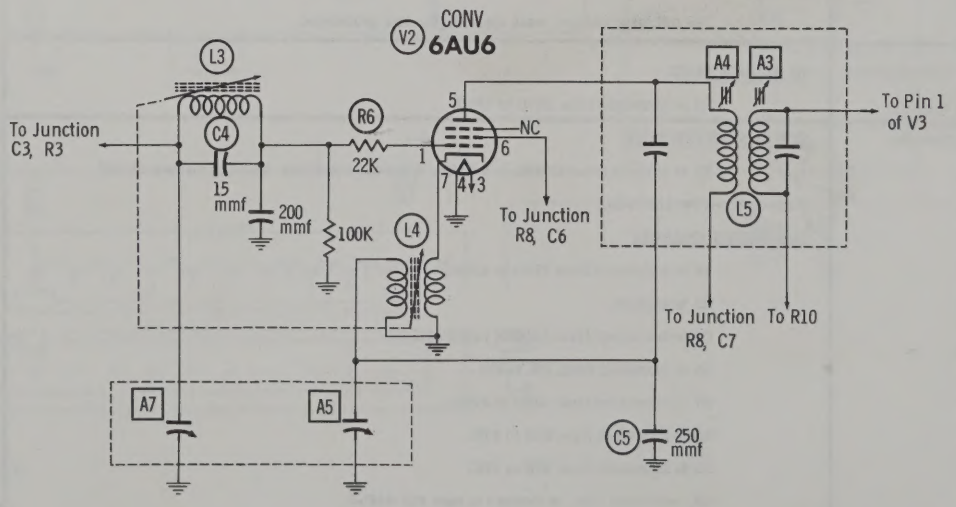

V16 HV RECT
1B3GT
DO NOT MEASURE
Plate of V14
T1
R91
4.7Ω
R92
100K 1W
To CRT
Horizontal Deflection Coils
To Junction R90, R44
56 mmf
11
10
2.2K
7
3
4
C77 47 mmf
C78 .047 mfd
225V
V15 DAMPER
12AX4GTA
L32
225V
To Junction R23, R25, C34
To Pin 6 of V7A
10K
56 mmf
Plate of VI4

FIG 3


V2 CONV
6AU6
L3
To Junction C3, R3
C4
15 mmf
200 mmf
R6
22K
100K
L4
NC
To Junction R8, C6
A4
A3
To Pin 1 of V3
L5
To Junction R8, C7
To R10
A7
A5
C5 250 mmf

AIRLINE MODELS 45XGAA-927A, -947A, -948A, -949A

AIRLINE MODELS 45XGAA-927A, -947A, -948A, -949A

PROPERTY OF
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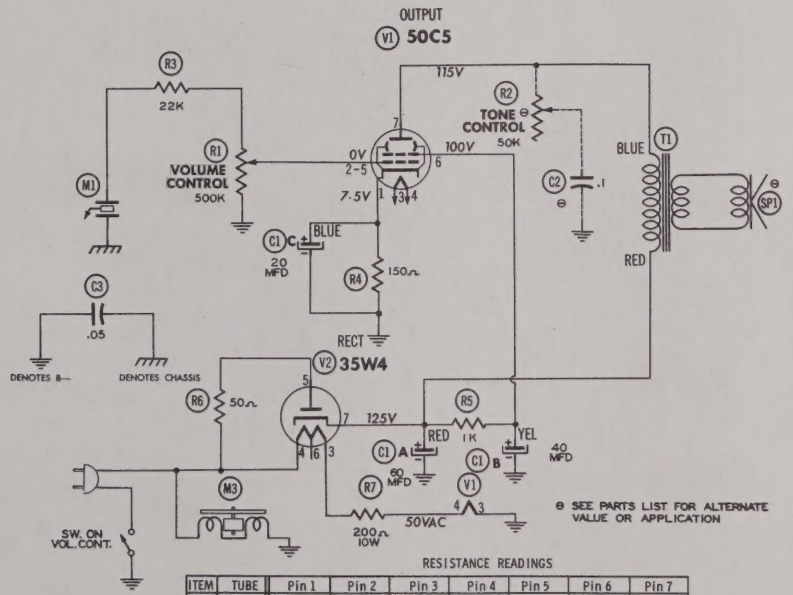
AIRLINE MODELS 45XGAA-927A, -947A, -948A, -949A

TRADE NAME	Airline Models 45XGAA-927A, 45XGAA-947A, 45XGAA-948A, 45XGAA-949A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Manual Record Player
TUBES (TWO)	Types 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .41 Amp. @ 117 Volts AC



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	50C5	150Ω	17Ω	0Ω	42Ω	17Ω	†1000Ω	†180Ω
V2	35W4	NC	NC	42Ω	65Ω	85Ω	60Ω	250K

† MEASURED FROM PIN 7 OF V2.
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	50C5	

ITEM No.	USE	TYPE	NOTES
V2	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	1016	PRS150V/ 804020	BBRT8415C	TCT3117	TDLT-7	FMT-333	TVA-3455
B	40	150							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	Note 1
C3	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	

Note 1: Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	412	AB-60	A47-500&-Z	Q13-133	U-48	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1B
R2	50K	½	403					Tone - Note 1

Note 1: Used in model 45XGAA-949A only.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRLINE PART No.	IRC PART No.	
R3	22K			BTS-22K	
R4	150Ω			BTS-150	
R5	1000Ω			BTS-1000	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRLINE PART No.	IRC PART No.	
R6	50Ω			BTS-47	
R7	200Ω	10			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2. 4K	3. 6Ω	1209	Z1101	A-3025	A-3332	26S58①	S-12X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3. 6Ω	2611-GC	4A07	223S1	
	4" X 6"	PM	3. 6Ω	2617 ①	46A07	246S2	① Used in model 45XGAA-949A

PHONO CARTRIDGE

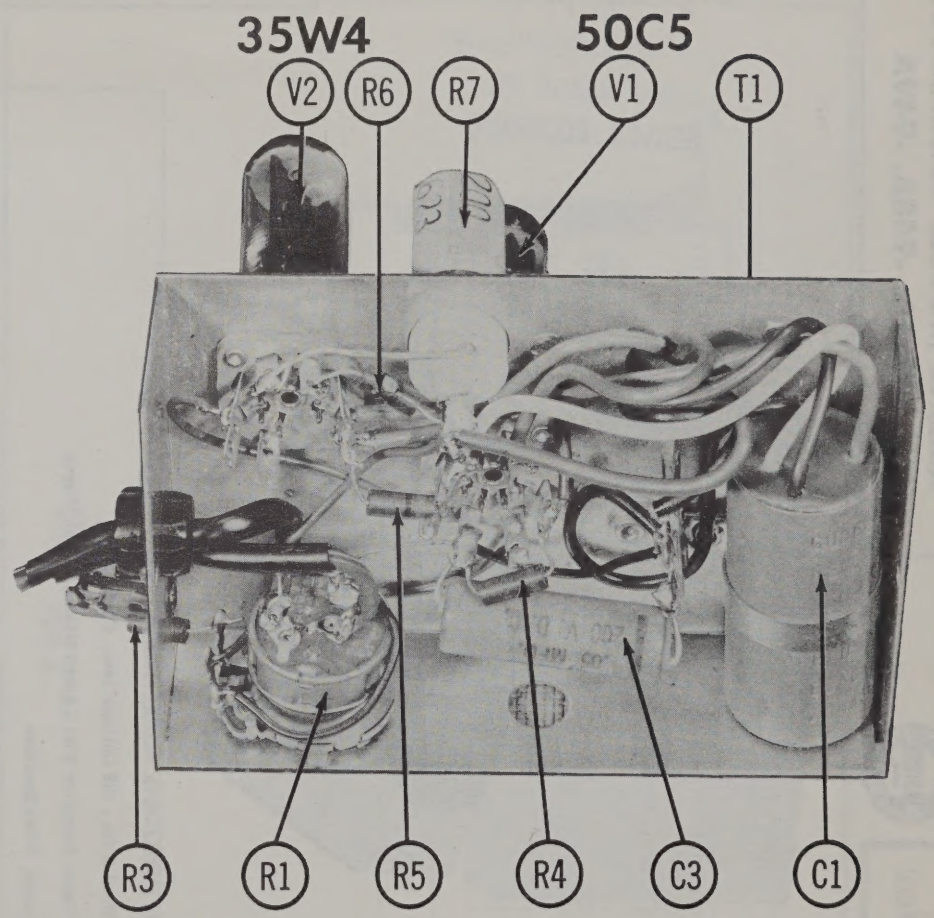
ITEM No.	REPLACEMENT DATA					REMARKS
	AIRLINE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	60-39	106				

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	AIRLINE PART No.	FIDELITONE PART No.	JENSEN PART No.	WALCO PART No.	
M2	61-32	*B-80	*J-752 or *J-152		* Metal

CHASSIS—BOTTOM VIEW



MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Phono Motor	2580	3 Speed

CROSLEY MODELS J-17TABH, TAMH, TAWH (Ch. 481)

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . unless it has been purchased as part of a complete volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

CROSLEY MODEL J-17TAWH

TRADE NAME	Crosley Models J-17TABH, J-17TAMH, J-17TAWH (Ch. 481)
MANUFACTURER	Crosley Corp., 1329 Arlington St., Cincinnati, Ohio
TYPE SET	Television Receiver
TUBES	Fifteen
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.2 Amp. @ 117 Volts AC
TUNING RANGE	Channel 2 thru 13 , Video IF 26.4MC, Sound IF 21.9MC (Intercarrier)

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CROSLEY MODELS J-17TABH, TAMH, TAWH (Ch. 481)

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DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL

1. Remove 6 push-on type control knobs from side panel of cabinet.

2. Remove 5 wood screws. Remove rear cover.

3. Disconnect speaker leads.

4. Remove 1 wood screw holding antenna terminal bracket.

5. Remove 2 wood screws on the inside rear corners that hold the chassis mounting board to the corner braces on the bottom of each side and 2 screws that hold the chassis to the wood strip, inside of cabinet above the chassis.

6. Remove 4 hex head screws on the underside of the chassis mounting board (along sides of the cabinet) and 1 wood screw at the bottom front center of the chassis mounting board.

7. Lift cabinet from chassis mounting board.

8. Remove 2 speaker nuts. Remove speaker.

MODEL	CHASSIS
J-17TABH, J-17TAMH, J-17TAWH	481

CROSLEY MODELS J-17TABH, TAMH, TAWH (Ch. 481)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 wood screws holding wood molding at the bottom edge of the safety glass. Remove molding and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Remove rear cover and supply power to chassis. Set horizontal hold control at mid-range position and adjust horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust buzz control (R9) for maximum volume and minimum buzz.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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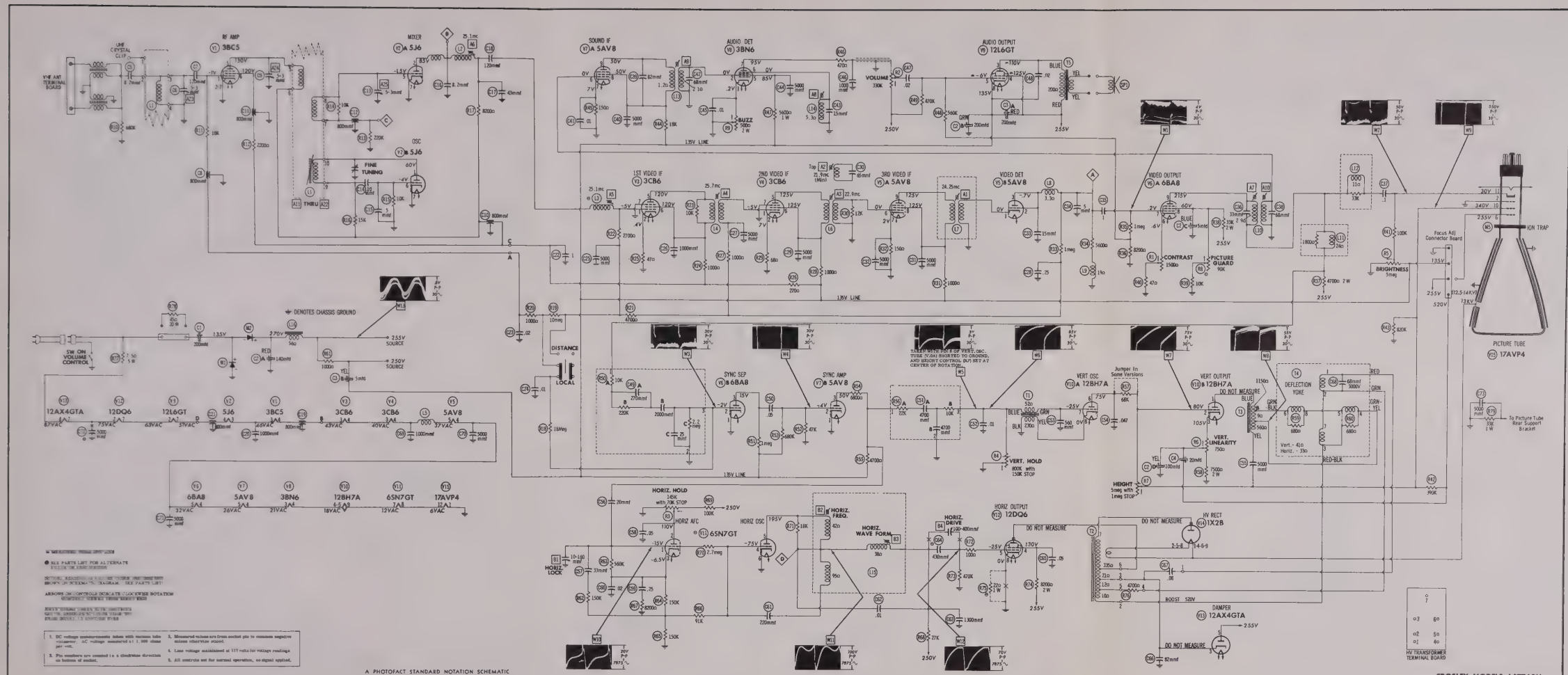

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted i.e. a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation, no signal applied.

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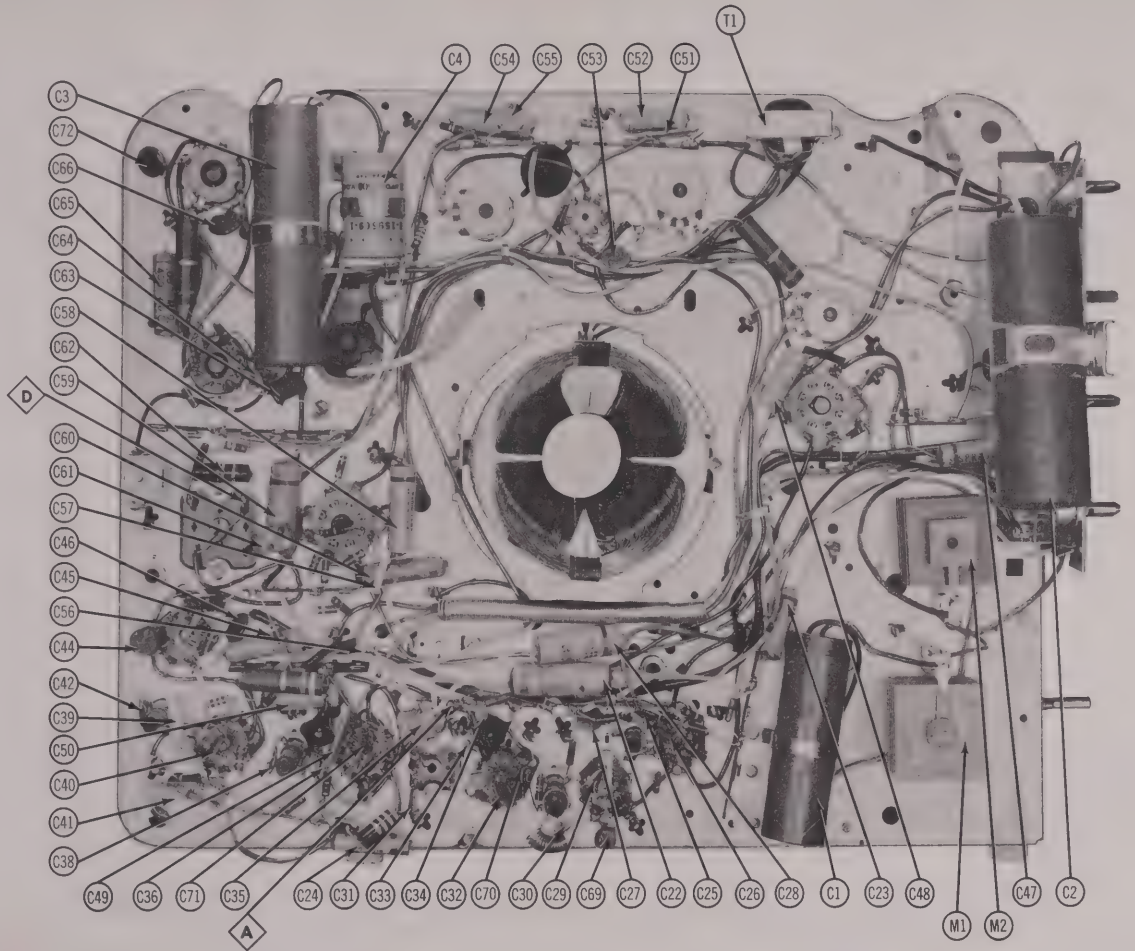
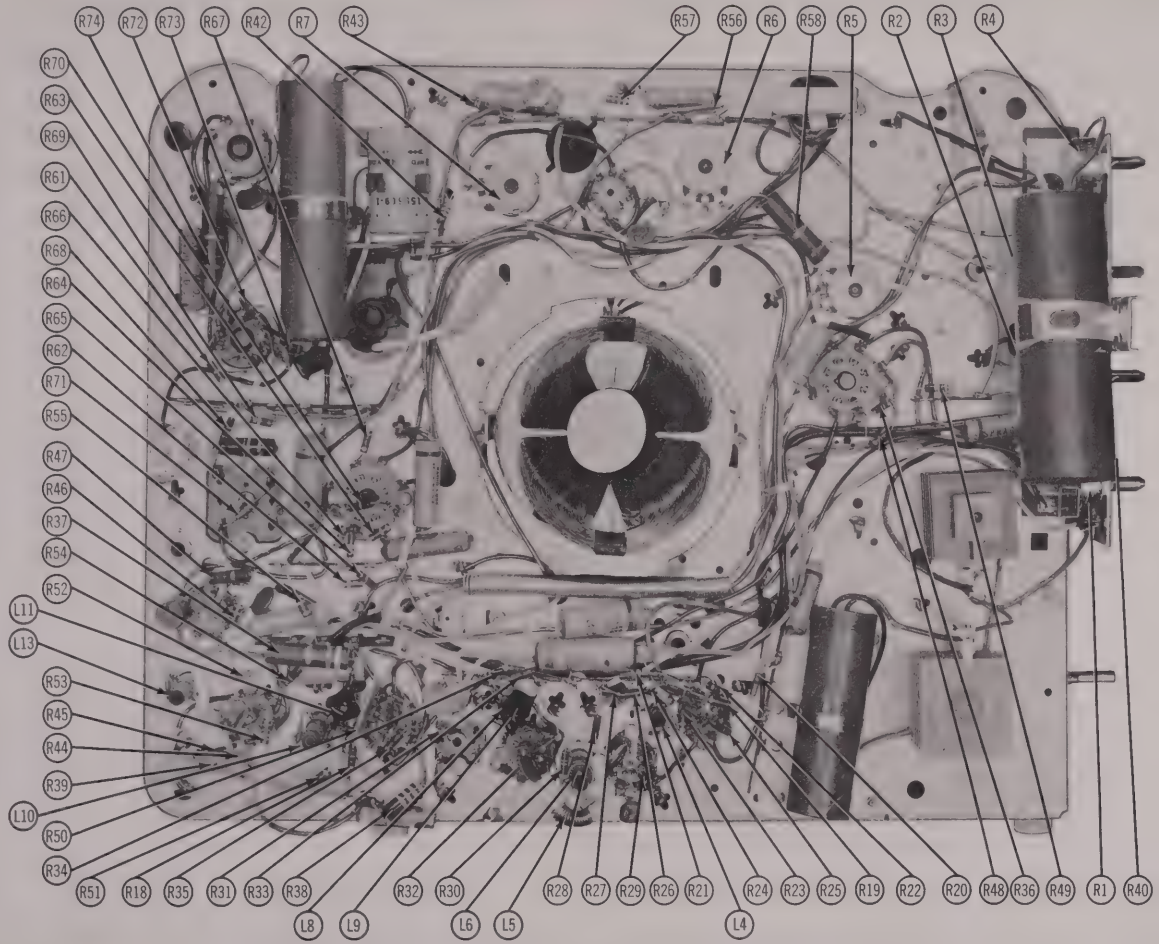
CROSLEY MODELS J-17TABH, TAMH, TAWH (Ch. 481)

CROSLEY MODELS J-17TABH, TAMH, TAWH (Ch. 481)

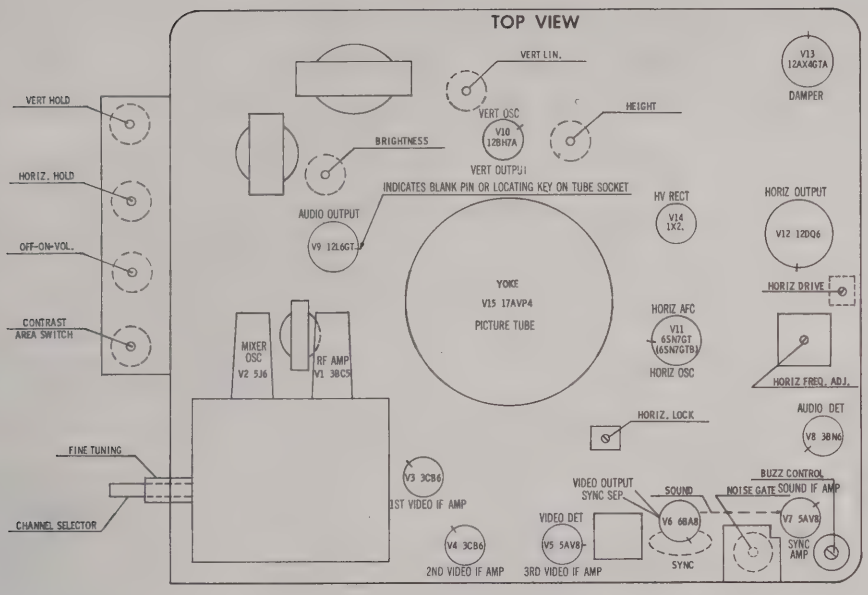


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

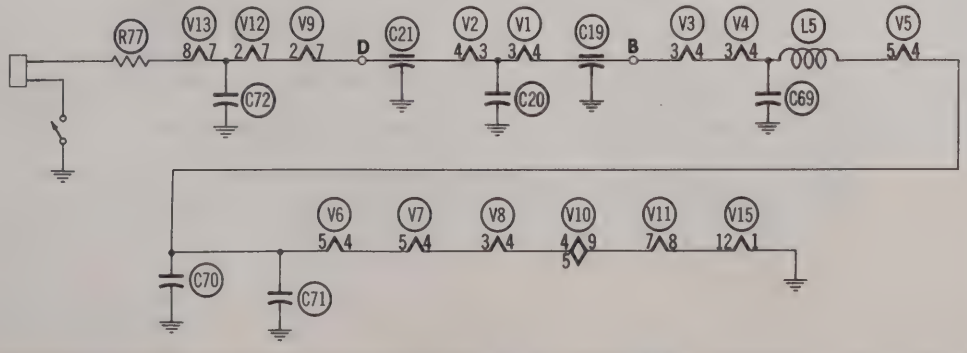
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V9**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V15**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V7, V10**
No horiz. sync - **V7, V11**
No vert. or horiz. sync - **V6, V7**

SWEEP FAILURE
No raster, has sound - **V11, V12, V13, V14, V15**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V11, V12, V13**
Narrow picture - **V11, V12, V13, V14, M1, M2**
Vert. off freq. - **V7, V10**
Horiz. off freq. - **V7, V11**

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube in series will cause the set to be inoperative (See circuit below).



SET 332 FOLDER 3

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped away from the chassis. Do not remove the horizontal oscillator tube (V11) to disable the high voltage.

VIDEO IF ALIGNMENT

Turn contrast control to the minimum position. Connect the negative lead of a 3 volt bias supply to the ungrounded side of C28. Connect the positive lead to chassis. Attenuate generator output to maintain not more than 2 volts on the VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to point (B). Low side to tuner.	24.25MC	Any non-interfering channel.	DC probe thru 10K to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	22.9MC	"	"	A2	Adjust for maximum deflection. If two peaks occur, use peak with slug nearest chassis.
3.	"	"	21.9MC	"	"	A3	Increase generator output and adjust A3 for MINIMUM deflection. Use null with slug farthest from chassis. Repeat steps 2 and 3.
4.	"	"	25.7MC	"	"	A4	Adjust for maximum deflection.
5.	"	"	25.1MC	"	"	A5	Adjust for maximum deflection. If two peaks occur, use peak with slug nearest chassis.
6.	"	High side to point (C). Low side to chassis.	25.1MC	"	"	A6	Connect a 100Ω resistor in series with a 1000MMF capacitor across L3. Adjust A6 for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

Leave bias connected as under "Video IF Alignment".
Use only enough sweep generator output to provide usable pattern on scope.
If it is necessary to disable the local oscillator tube to reduce the possibility of erroneous indications, remove the converter tube and replace with a 5J6 which has pin 1 removed.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to floating tube shield over converter tube. Low side to chassis.	25.0MC	21.9MC 22.9MC 24.25MC 25.1MC 25.7MC 26.4MC 27.9MC	Any non-interfering channel.	Vert. amp. thru 10K to point (A). Low side to chassis.		Check for response similar to Fig. 1. If necessary, SLIGHTLY retouch A1, A2, A4, A5 and A6 for desired response. Adjust A3 so that 21.9MC marker falls in trap notch. Replace original 5J6 in its socket.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to point (A). Low side to chassis.	Not used.	4.5MC (400∿ Mod)	Any	Vert. amp. thru detector (Fig. 2) to pin 11 (cathode) of picture tube. Low side to chassis.	A7	Adjust for MINIMUM 400∿ indication on scope.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Turn the set on and tune in a strong TV signal. Turn the buzz control (R9) 90° from maximum clockwise rotation. Adjust A8 for maximum volume. Reduce the signal strength into the receiver by inserting an attenuator in series with the antenna and the receiver antenna terminals. If a suitable attenuator is not available, remove the antenna from the antenna terminals and stray feed the signal into the receiver by placing the antenna near the antenna terminals. Adjust A9 and A10 for maximum volume. Adjust R9 for minimum noise. Reconnect antenna and readjust A8 for maximum volume. If necessary, reduce the volume so this peak can be heard.

ALTERNATE SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Set the volume control at a low level.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Direct	High side to point (A). Low side to chassis.	4.5MC (7.5KC Swp)	4.5MC (400∿ Mod)	Any non-interfering channel.	Across secondary of audio output generator	A8	Set buzz control (R9) 90° from maximum clockwise rotation. Adjust A8 for maximum 400∿ indication on scope.
13.	"	"	"	"	"	"	A9, A10	Attenuate signal generator so that signal level is below the limiting level of the 3BN6 as evidenced by background hiss and noise. Adjust A9 and A10 for maximum response on scope.
14.	"	"	Not used.	4.5MC (400∿ AM Mod)	"	"	R9	Use high signal generator output and adjust R9 for MINIMUM 400∿ indication on scope.
15.	"	"	4.5MC (7.5KC Swp)	4.5KC (400∿ FM Mod)	"	"	A8	With volume control at low level, retouch A8 for maximum 400∿ indication on scope.

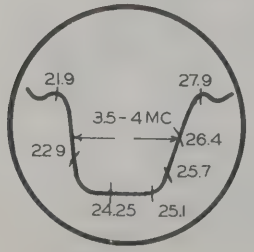


FIG. 1

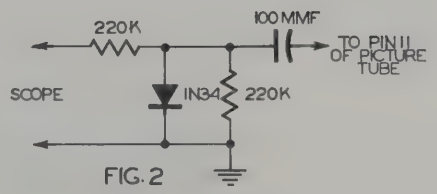


FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Leave bias connected as under "Video IF Alignment". If a dummy converter tube was used, replace with the original 5J6. The channel oscillator adjustment screws are reached through a hole just above the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	57MC (10MC Swp)	55. 25MC 59. 75MC	2	Vert. amp. thru 10K to point Ⓐ. Low side to chassis.	A11	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should fall at 40%.
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A12	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A13	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A14	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A15	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A16	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A17	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A18	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A19	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A20	
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A21	
			213MC (10MC Swp)	211. 25MC 215. 75MC	13		A22	

RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to the AGC line (white wire from the tuner).
Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193. 25MC 197. 75MC	10	Vert. amp. thru 10K to point Ⓒ. Low side to chassis.	A23, A24, A25	Adjust for response curve similar to Fig. 4 with markers above 90%.
18.	"	"	213MC (10MC Swp)	211. 25MC 215. 75MC	13	"		If markers fall below 70% on any channel, make compromise adjustments of A23, A24 and A25 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12			
			201MC (10MC Swp)	199. 25MC 203. 75MC	11			
			189MC (10MC Swp)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp)	175. 25MC 179. 75MC	7			
			85MC (10MC Swp)	83. 25MC 87. 75MC	6			
			79MC (10MC Swp)	77. 25MC 81. 75MC	5			
			69MC (10MC Swp)	67. 25MC 71. 75MC	4			
			63MC (10MC Swp)	61. 25MC 65. 75MC	3			
			57MC (10MC Swp)	55. 25MC 59. 75MC	2			

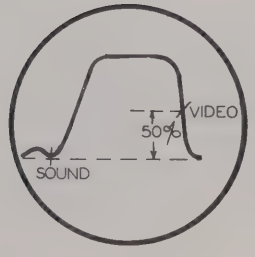


FIG. 3

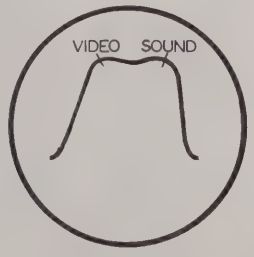
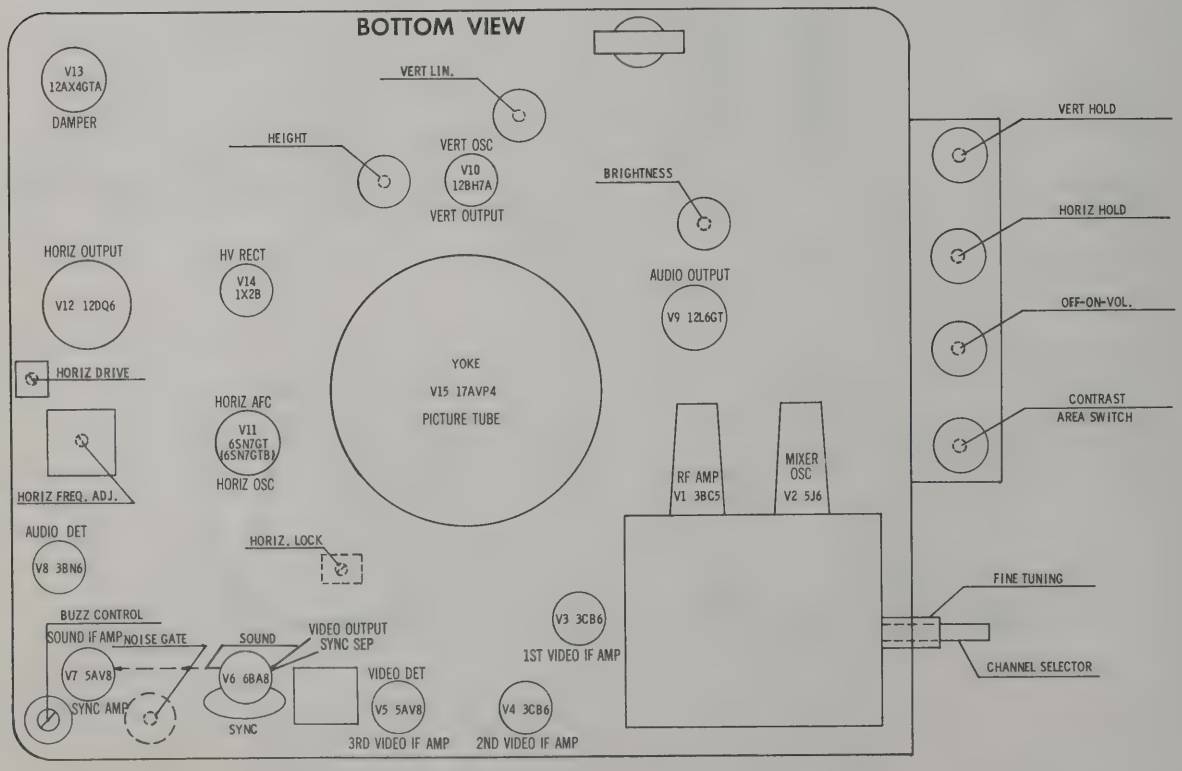


FIG. 4

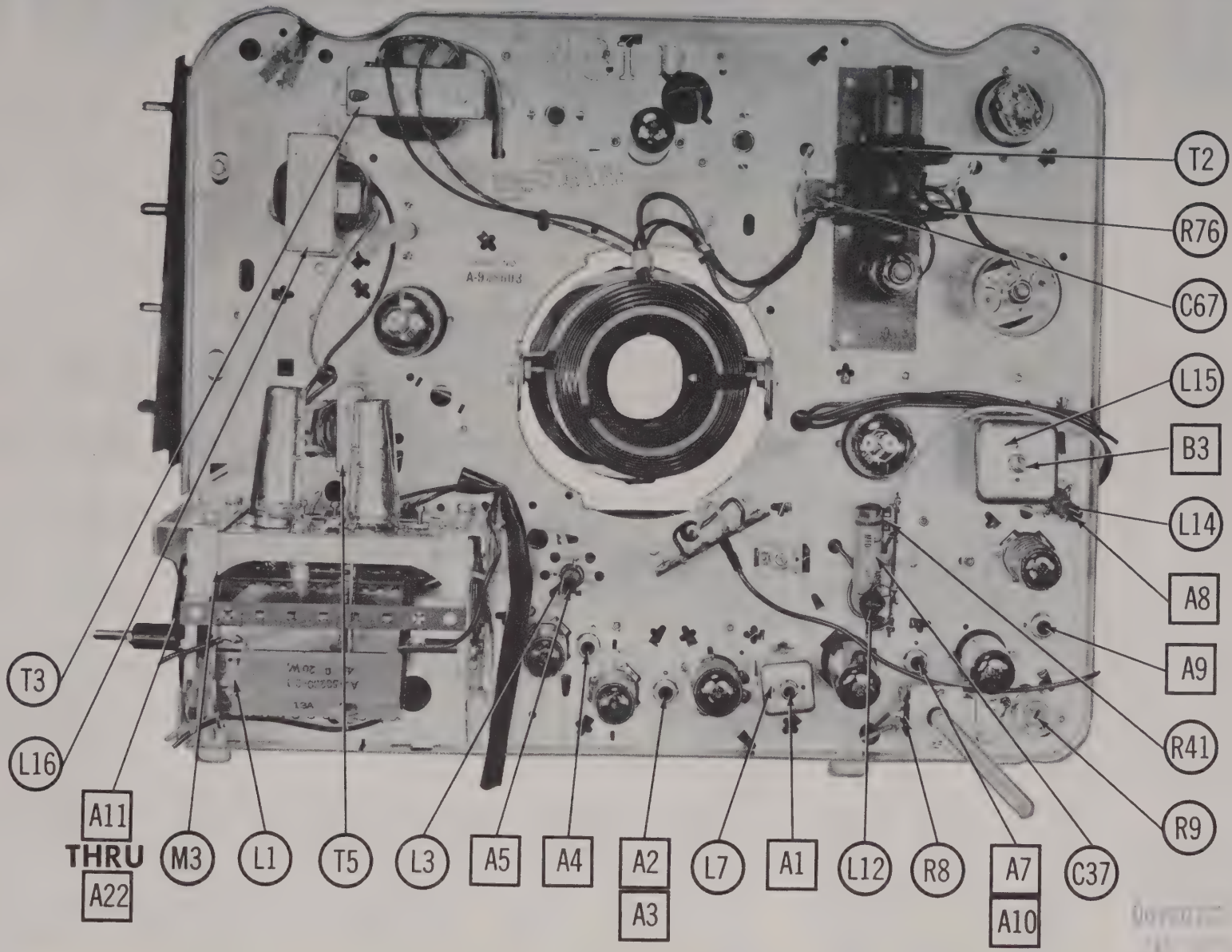
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	7Meg	0Ω	12Ω	11Ω	■ 220Ω	■2400Ω	0Ω		
V2	5J6	■15K	■ 8.4KΩ	12Ω	13Ω	220K	10K	0Ω		
V3	3CB6	1Meg	47Ω	11Ω	10Ω	■1200Ω	■1200Ω	0Ω		
V4	3CB6	1Meg	68Ω	10Ω	9Ω	■1000Ω	■1000Ω	0Ω		
V5	5AV8	.4Ω	5600Ω	5600Ω	8Ω	9Ω	.4Ω	150Ω	■1000Ω	■1000Ω
V6	6BA8	0Ω	2Meg	■ 1Meg	7Ω	8Ω	● 55Ω	1Meg	† ● 25K	†4700Ω
V7	5AV8	0Ω	47K	■ 12K	6Ω	7Ω	.9Ω	150Ω	■18K	■18K
V8	3BN6	● 220Ω	2.1Ω	6Ω	5Ω	■ 5600Ω	5.3Ω	†330K		
V9	12L6GT	NC	15Ω	†255Ω	†56Ω	250K	TP	13Ω	90K	
V10	12BH7A	▲1100Ω	●▲1.8Meg	7500Ω	5Ω	5Ω	●▲1.8Meg	● 400K	52Ω	3Ω
V11	6SN7GT	700K	†70K	300K	250K	†28K	0Ω	3Ω	2Ω	
V12	12DQ6	NC	17Ω	TP	†8200Ω	470K	TP	15Ω	0Ω	TOP CAP ▲21Ω
V13	12AX4GTA	NC	NC	650KΩ	NC	†56Ω	NC	17Ω	20Ω	
V14	1X2B		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲360Ω
V15	17AVP4	0Ω	0Ω	PIN 6 †56Ω	PIN 10 ▲350K	PIN 11 ●■250K	PIN 12 2Ω			

† MEASURED FROM OUTPUT OF M2.
■ MEASURED FROM 135V LINE
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 3 OF V13.
TP TIE POINT
NC NO CONNECTION.



TUBE PLACEMENT CHART



CHASSIS TOP VIEW

CROSLEY MODELS J-17TABH, TAMH, TAWH (Ch. 481)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	2BC3	
V2	Mixer-Oscillator	5J6	
V3	1st Video IF Amplifier	3C9H	
V4	2nd Video IF Amplifier	3C9H	
V5	3rd Video IF Amplifier- Video Detector	3AV8	
V6	Video Output-Sync Separator	6BA8	
V7	Sound IF Amplifier - Sync Amplifier	3AV8	

Note 1. 6BN7GTB may be used in some versions.

ITEM No.	USE	TYPE	NOTES
V8	Audio Detector	3BN6	
V9	Audio Output	12L6GT	
V10	Vert.Osc - Vert. Output	12BH7A	
V11	Horiz. AFC - Horiz. Osc	6SN7GT	Note 1
V12	Horiz. Output	12DQ6	
V13	Damper	1X2B(GE)6AV5GA	
V14	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No.	CROSLEY PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V13	17AVP4	17AVP4A ②	17AVP4A ③	17AVP4A ①	① Aluminized ② Silver screen .85

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP	RATING VOLT	CROSLEY PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	300	200	158557-1	PRI-075	EZ10408	WS342	TD-200-200	D-100	R1846
C1A	140	150	158940-3	PRI-677	E10439	WT449	CUBQ1008	C-1353	TVA-4407
B	200	200				TCD49		S-230	
C	100	500							
D	100	150							
C1A	300	300	158317-1	PR2-275	EZ10408	WD345		D-100	R3063 *
B	50	300			BR825			MT-2504	
C4	20	500	158969-1	PR5500V20	BR3050	TC66	TD-20-500	S-315	TVA-1906

* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP	RATING VOLT	CROSLEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	8.2		158106-15	NPO-D18 2	Z5U		Z5U		CT45EA	
C6	5-3		158966-5				3125-01-GR5			
C7	220		158966-25	DE-00012	DD-121	G044	811-121		UC-5312	5GA-T13
C8	900									
C9	5-3		158966-5		839-3		3125-01-GR5		CT45EA	
C10	900									
C11	900									
C12	500									
C13	5-3		158966-5		839-3		3125-01-GR5		CT45EA	
C14	15		158966-13	NT50-D15	TCH-10	N015	NT50A-100		NT-541	5TCU-Q1
C15	5		158966-10							
C16	8.2		158106-15	NPO-D18 2		Z5U	NPOA-8R2			
C17	43		158106-25		TCZ-43	Z5U3	NPOL-430			
C18	220		158966-15	DI-00012	DD-121	G044	811-121	UC-5312		5GA-T13
C19	900									
C20	3300		158215-9	BPD-001	DD-102	K069	801-001	DC-521		5HK-D1
C21	900									
C22	.1	400	19478-47	P488N-1	DF-104	CUB4P1		PT401		4TM-P1
C23	.01	300	19001-50	BPD-02	DD-103	K072		PT402		4TM-S2
C24	.01	300	19478-41	BPD-01	DE-103	CUB4S1		GP3-333-103	PT411	4TM-S1
C25	1000		144675-3	BPD-005	DD-502	K080		811-001	DC-525	5HK-D5
C26	1000		144675-2	BPD-001	DD-501	K069		801-001	DC-521	5HK-D1
C27	5000		144675-2	BPD-005	DD-502	K080		811-005	DC-525	5HK-D5
C28	5000	25	157910-1	P488N-25		CUBAP25			PT025	2TM-P25
C29	5000		144675-2	BPD-005	DD-502	K080		811-006	DC-525	5HK-D5
C30	65		157499-35	BPD-065		22E5265			MS-468	
C31	1000		144675-2	BPD-005	DD-502	K080		811-005	DC-525	5HK-D5
C32	5000		144675-2	BPD-005	DD-502	K080		811-005	DC-525	5HK-D5
C33	15		157737-43	M750-E15	TCH-15		N750K-150			5TCU-Q15
C34	5		157737-103							
C35	.1	75	157906-1	P488N-1		DF-104	CUB4P1		PT401	4TM-P1
C36	33		157737-138							
C37	.1	400	19478-47	P488N-1		DF-104	CUB4P1		PT401	4TM-P1
C38	68		157737-153							
C39	82		157737-54							
C40	5000		144675-2	BPD-005	DD-502	K080		811-005	DC-525	5HK-D5
C41	.01	300	19478-41	BPD-01	DE-103	CUB4S1		GP3-333-103	PT411	4TM-S1
C42	68		157737-153							
C43	15		157737-43							
C44	5000		144675-2	BPD-005	DD-502	K080		811-005	DC-525	5HK-D5
C45	.01	300	19478-41	BPD-01	DE-103	CUB4S1		GP3-333-103	PT411	4TM-S1
C46	1000		158215-17	BPD-001	DD-102	K069		801-001	DC-521	5HK-D1
C47	.02	300	19001-80	BPD-03	DE-203	CUB4S3		817-03	PT413	4TM-S3
C48	.02	400	19001-80	BPD-03	DF-203	CUB4S3		817-03	PT413	4TM-S3
C48A	270									
B	5000		1172207-1							
C	25									
C50	.05	300	19001-17	BPD-06	DF-503	CUB3S5		817-05	PT415	3TM-S5
C51A	47UU		457523-1	APC-333 ③	APC-106		ED79	811-0047	DC-5347	4V-5
B	470						ED79	811-0047	DC-5347	
C52	.01	400	19478-41	BPD-01	DE-103	CUB4S1		GP3-333-103	PT411	4TM-S1
C53	.05	600	144675-23	1464-00056	DE-503		DE5756	811-503		MS-356
C54	.047	400	19478-48	BPD-05	DF-503		CUB4S47		PT4167	4TM-S47
C55	5000		158215-35	BPD-005	DD-502		K080	811-006	DC-525	5HK-D5
C56	.02	300	19001-81							
C57	33		157737-126							
C58	.05	300	19001-17	BPD-06	DF-503		CUB3S5		PT415	3TM-S5
C59	.25	35	157938-1	P288N-25			CUB3P25		PT4025	3TM-P25
C60	.05	300	19001-89	BPD-03	DF-303		CUB3S3	817-03	PT413	3TM-S3
C61	.02	600	144675-23	1464-00023	DE-231		KMR5T23	811-231		MS-323
C62	.01	600	157998-1							
C63	.05	1200	158215-27	1464-0033			DE5D53			MS-353
C64	430			1438-00043			SE5743			MS-343
C65	.05	400	19001-17	BPD-06	DF-503		CUB3S5		PT415	3TM-S5
C66	82		158215-33	1464-000063	DE-830		E040	811-830		MS-482
C67	.05	300	19001-89							
C68	68	3000	158215-3	HVD-30-68	DD30-680	V3Q68	SEV-680	DC30468		30GA-G89
C69	1000		144675-14	BPD-001	DD-103	K069	801-001	DC-521		5HK-D1
C70	5000		144675-3	BPD-005	DD-502	K080	811-005	DC-525		5HK-D5

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	CROSLEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	REPLACEMENT DATA ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C71	5000		144675-3	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C72	5000		144675-3	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	Note 3
C73	5000		144675-3	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	

Note 1. Code A chassis uses 1500MMF unit (part #144675-3) in this application. Other versions may use 390MMF unit (part #158215-77).
Note 2. Not used in Code A chassis.
† Items C48A, C48B, C48C, R50A, R50B and R50C are combined in one unit.
* Items C51A, C51B, R56A and R56B are combined in one unit.

CONTROLS

ITEM No.	RATING RESIST ANCE	RATING WATTS	CROSLEY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1500Ω	1	BiT137-1-1					Contrast
R2A	330K		B1S7802-1-4	B-SI-S	A47-800K-S	Q13-135	TA334A	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
C	Switch		Not Req.	Not Req.	SWE-13	16-1	UA-38	Attach to R2A
R3A	145K	1	B1S7802-1-5	+B-3S	+A47-75K-S	+Q41-135	+TA151.	Horiz. Hold-Stop at 90K
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A
R4A	800K	1	B1S9338-1-3	†AB-8S	†A47-750K-S	†Q41-134	†TA18A	Vert. Hold-Stop at 150K
B	Shaft		Not Req.	AK-3	FS-3	Not Req.	Not Req.	Attach to R4A
R5A	1Meg	1	B1S7802-1-6	AB-8S		Q17-142	PTA28B	Brightness
B	Shaft		Not Req.	AK-10		TQ	Not Req.	Attach to R5A
R6A	750K	1	B1S7802-1-4	AB-5	A47-750-S	Q11-105	PTA76L	Vert. Linearity
B	Shaft		Not Req.	AK-10	RV-1	Not Req.	Not Req.	Attach to R6A
R7A	5Meg	1	B1S7802-1-4	†AB-8S	†A47-4Meg-S	†Q11-141	†PTA56L	Height-Stop at 1Meg
B	Shaft		Not Req.	AK-10	RV-1	Not Req.	Not Req.	Attach to R7A
R8	80K	2	B1S9037-1-1					Picture Guard - Note 1
R9	5000	2	157155-3			39-500		Bass Wire-wound

* Connect a 68K resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down.)
† Connect a 150K resistor in series with the left hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminal down.)
‡ Connect a 1Meg resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminal down.)
Note 1: Control has open spot on one end.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	CROSLEY PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R10	680K		33074-37	BTS-680K	
R11	82K		33074-27	BTS-10K	
R12	2200Ω		33074-53	BTS-2200	
R13	330K		33074-53	BTS-330K	
R14	10K		33074-27	BTS-10K	
R15	10K		33074-27	BTS-10K	
R16	15K		33074-39	BTS-15K	
R17	82000		33074-38	BTS-8200	
R18	18Meg		33074-68	BTS-18Meg	
R19	10Meg		33074-55	BTS-10Meg	
R20	1000Ω		33074-25	BTS-1000	
R21	47000		33074-35	BTS-4700	
R23	2700Ω		33074-30	BTS-2700	
R23	10K		33074-27	BTS-10K	
R24	1000Ω		33074-25	BTS-1000	
R25	47Ω		33074-17	BTS-47	
R26	33Ω		33074-17	BTS-330	
R27	1000Ω		33074-25	BTS-1000	
R28	1000Ω		33074-25	BTS-1000	
R33	1Meg		33074-61	BTS-1Meg	
R34	56000		33074-34	BTS-5600	
R35	1Meg		33074-61	BTS-1Meg	
R36	33000		33074-36	BTS-3300	
R37	47000	2	156969-9	BTS-4700	
R38	33K	2	33074-319	BTS-33K	
R39	10K		33074-27	BTS-10K	
R40	47Ω		33074-49	BTS-47	
R41	100K		33074-49	BTS-100K	
R42	330K		33074-56	BTS-330K	
R43	820K		33074-60	BTS-820K	
R44	18K		33074-40	BTS-18K	
R45	150Ω		33074-16	BTS-150	
R46	470Ω		33074-21	BTS-470	

ITEM No.	RATING OHMS	RATING WATT	CROSLEY PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R47	56000	1	33074-122	BTA-5600	
R48	560K		33074-58	BTS-560K	
R49	470K		33074-57	BTS-470K	
R50A	10K			BTS-10K	
B	220K		†1170207-1	BTS-220K	
C	2.2Meg			BTS-2.2Meg	
R51	1Meg		33074-61	BTS-1Meg	
R52	47K		33074-45	BTS-47K	
R53	560K		33074-58	BTS-560K	
R54	5600Ω		33074-35	BTS-5600	
R55	4700Ω		33074-33	BTS-4700	
R56A	33K		1457823-3	BTS-33K	
B	10K			BTS-10K	
R57	82K		33074-47	BTS-82K	
R58	75000 5%	3	156941-4	BTS-7500 5%	
R59	680Ω		33074-33		
R60	680Ω		33074-33		
R61	10000		33074-25	BTS-1000	
R62	150K		33074-54		
R63	560K		33074-58		
R64	150K		33074-54		
R65	150K		33074-54		
R66	10K 5%		33074-27		
R67	8200Ω		33074-36		
R68	27K		33074-43		
R69	100K		33074-49		
h70	2.2Meg		33074-71		
R71	18K		33074-40	BTS-18K	
R72	1000		33074-13		
R73	47UU		33074-57		
R74	8200Ω	2	156941-10		
R75	22Ω	1	33074-93		Note 1
R76	4700Ω		33074-35		
R77	45Ω	20	156230-3		
R78	7.5Ω	5	156238-1	FR-7.5	
R79	33K	1	33074-131	BTA-33K	

† Items R50A, R50B, R50C, C49A, C49B and C49C are combined in one unit.
* Items R56A, R56B, C51A and C51B are combined in one unit.
Note 1: Used only in chassis coded "A" and "B".

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	CROSLEY PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Vert.Osc. Trans.	158355-3	BS704	A-3006		KH3*	24A05	A-1232①	
T2	Horiz.Output Trans.	158481-5 ①	FB418 *	HVO-37 *		Y315	A-8365*	FLY-25*	D-46 *
T3	Vert.Output Trans.	156726-2	21B07	A-3834					
T4A	Yoke(90°) Horiz.								
	(22MH)	158426-1②	DT60T②	MDF-22②	2358D①	Y90F18/43	DY-16A	Y-16①③④	Y-41-①④
B	Vert.(60MH)	158586-1③				Y90F18/43	DY-16A		Y-41-①④

① Drill new mounting hole(s).
② Includes resistor R 76.
③ Includes capacitor C66, resistors R59 and R60. Does not include rear cover and centering device.
④ Yoke rear cover and centering device.
⑤ Use original rear cover and centering device.
⑥ Use original yoke damping network.
⑦ To mount same as original, loosen and rotate core clamp 180° in this position, connect horizontal damping capacitor across terminals #1 and #2 and jumper terminals #3 and #5. To mount with leads out bottom as supplied, connect horizontal damping capacitor across terminals #3 and #7 and jumper terminals #1 and #8.

* HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Rem Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
6	6	6	3	6	6	6	
3	3	3	7	3	3	3	
5	5	5	2	5	5	5	
2	2	2	6	2	2	2	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	CROSLEY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	3.5KΩ	5-4Ω	157918-1	21005 ①	A-3833 ①	A-3833	34B50 ①	S-1X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	CROSLEY PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"	PM	3-4Ω	159880-1	4A07	223B1	

COILS (RF-1F)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	CROSLEY PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	Ant., RF, Mixer Grid, Osc. Coils	0Ω		158068-3				Channel 2
B	Ant., RF, Mixer Grid, Osc. Coils	0Ω		158068-3				Channel 3
C	Ant., RF, Mixer Grid, Osc. Coils	0Ω		158068-4				Channel 4
D	Ant., RF, Mixer Grid, Osc. Coils	0Ω		158068-5				Channel 5
E	Ant., RF, Mixer Grid, Osc. Coils	0Ω		158068-6				Channel 6
F	Ant., RF, Mixer Grid, Osc. Coils	0Ω		158068-6				Channel 6
G	Ant., RF, Mixer Grid, Osc. Coils	0Ω		158068-7				Channel 7
H	Ant., RF, Mixer Grid, Osc. Coils	0Ω		158068-8				Channel 8
I	Ant., RF, Mixer Grid, Osc. Coils	0Ω		158068-9				Channel 9
J	Ant., RF, Mixer Grid, Osc. Coils	0Ω		158068-10				Channel 10
K	Ant., RF, Mixer Grid, Osc. Coils	0Ω		158068-11				Channel 11
L	Ant., RF, Mixer Grid, Osc. Coils	0Ω		158068-12				Channel 12
L2	Osc. Coil	0Ω		158068-13				Channel 13
L3	1st Video IF	.8Ω		158185-3				
L4	1st Video IF	.3Ω	.3Ω	157787-1		17-1062	TV-102	6188	Core part #158204-2 Alternate part #158184-1 Used in some versions. Core Part #158204-2
L5	Pil. Choke	0Ω		155356-1		19-3001	TV-189	6175	.6 Microhenry
L6	3rd Video IF	.4Ω	.4Ω	159310-1				6353*	Includes 3L 9MC Trap
L7	4th Video IF	.6Ω	.6Ω	157844-1				6351	Core Part #158204-2
L8	Series Peaking Coil	3.3Ω		154378-1		19-1006		6634	15 Microhenries
L9	Shunt Peaking Coil	19Ω		159210-1		19-3500		6164	950 Microhenries Core Part #158204-3
L10A	4.5MC Trap	2.9Ω		157841-1					
B	1st Sound IF	.9Ω							
L11	Shunt Peaking Coil	34Ω		159215-1		19-4950a		6157a	905 Microhenries, Wound on 1. 8Ω Resistor
L12	Series Peaking Coil	11Ω		159237-1		19-3250a	TV-185a	6181a	250 Microhenries, Wound on 33KΩ Resistor Core Part #158204-2
L13	2nd Sound IF	1.3Ω	2.1Ω	159418-1					
L14	Quadrature Coil	5.3Ω		159431-1				1480	Core Part #158204-3

a Drill new mtg. hole.
b Parallel with 1. 8KΩ resistor.
c Parallel with 33KΩ resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	CROSLEY PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	NOTES
L15	43Ω	95Ω	157791-1	20-1403*	TV-163*	6182*		305N1*	H-100*	HH-3*	Waveform Winding - 38Ω Core Part #19013-27

*Reverse Coil Mfg. In Can.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~/~)	CROSLEY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L16	.190A	56Ω	18H	155539-1	C5040	C-3974 ①	C-3257 ①	28C41	C-33X ①

① Drill one new mounting hole.

CROSLEY MODELS J-17TABH, TAMH, TAWH (Ch. 481)

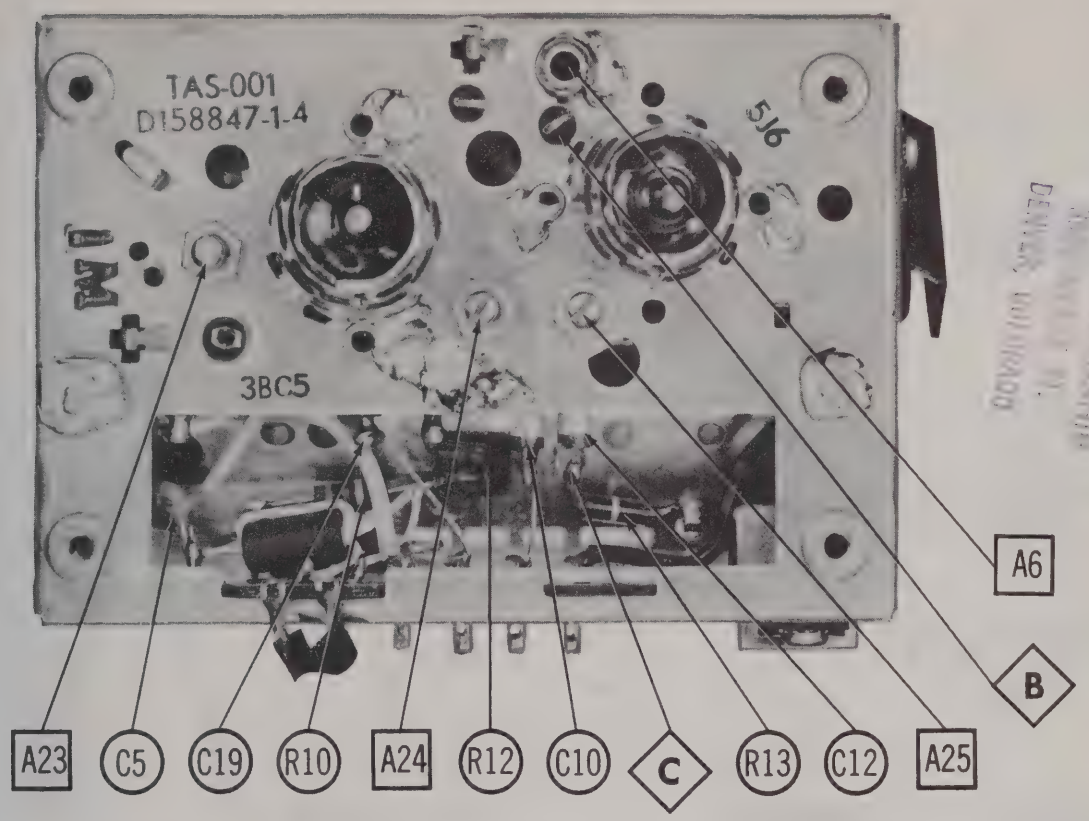
PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

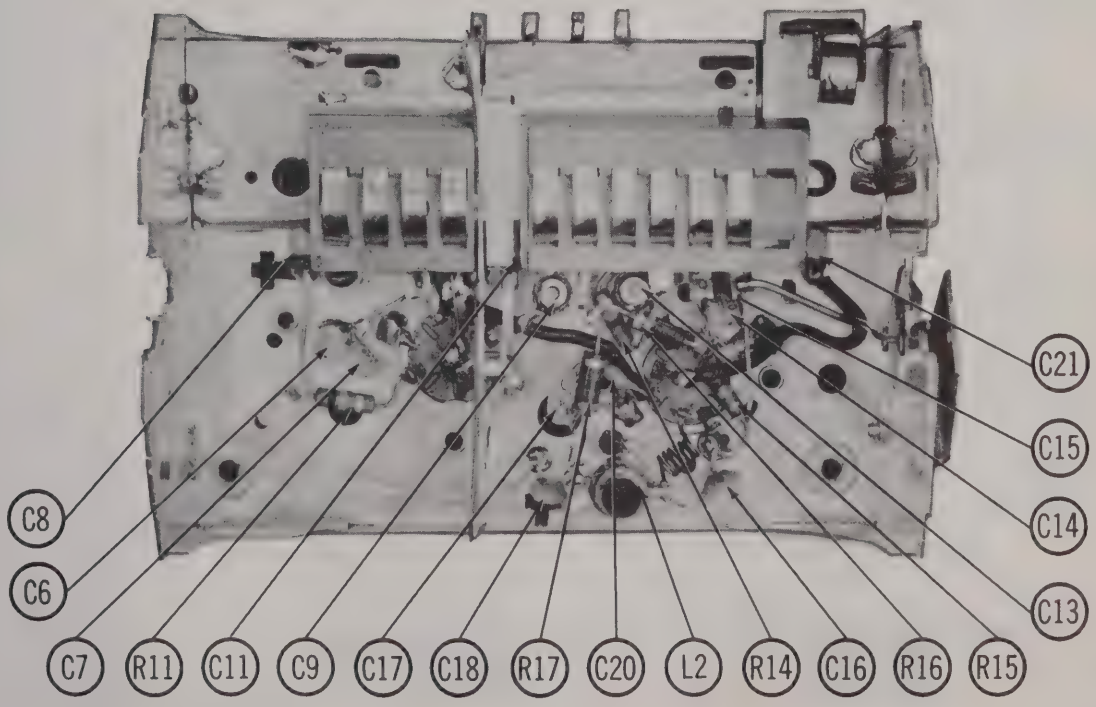
ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	CROSLEY PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.190A	155575-2	1236A	MR300	6S300	6Q4	300	
M2	.190A	155575-2	1236A	MR300	6S300	6Q4	300	

MISCELLANEOUS

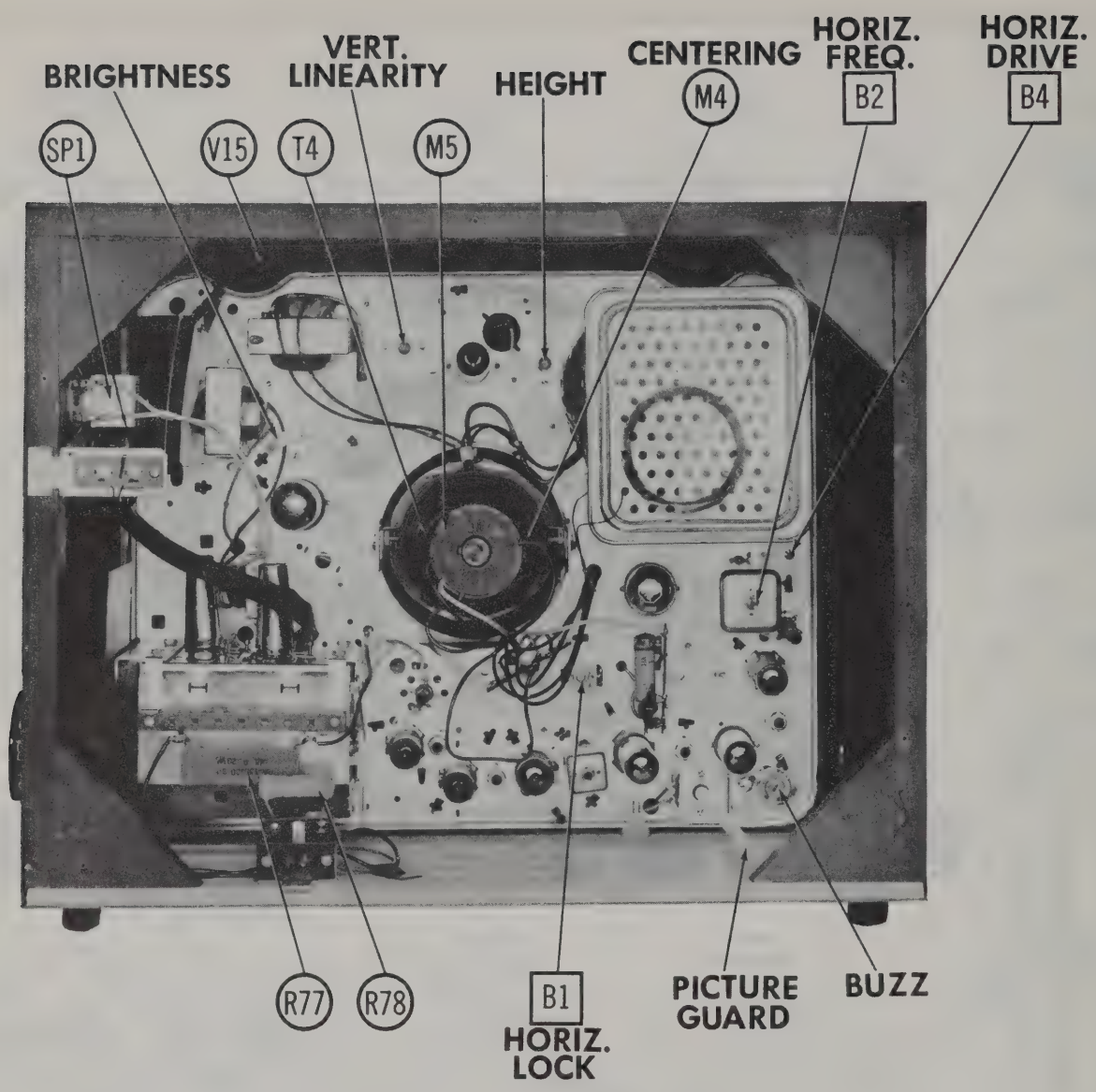
ITEM No.	PART NAME	CROSLEY PART No.	NOTES
M3	Tuner	158847-1	VHF
M4	Centering Device	153586-1	Includes deflection yoke (T4) rear cover
M5	Ion Trap	154924-3	
B1	Trimmer Cap.	157870-1	Horiz. Lock (10-160MMF)
B4	Trimmer Cap.	159882-1	Horiz. Drive (100-400MMF) Used in chassis coded "C" & "D" only
	Cabinet	170216-3	Model J-17TAMH
	Cabinet	170216-4	Model J-17TABH
	Cabinet	171113-3	Model J-17TAWH
	Knob	157753-8	VHF channel selector - Model J-17TAMH
	Knob	157753-9	VHF channel selector - Model J-17TABH
	Knob	157753-3	VHF channel selector - Model J-17TAWH
	Knob	157754-1	VHF fine tuning
	Knob	157750-9	Auxiliary controls (4 used) Model J-17TAMH
	Knob	157750-8	Auxiliary controls (4 used) Model J-17TABH
	Knob	157750-1	Auxiliary controls (4 used) Model J-17TAWH
	Mask	170458-2	Model J-17TAMH
	Mask	170458-3	Model J-17TABH
	Mask	170458-4	Model J-17TAWH
	Safety Glass	159054-7	Models J-17TAMH, J-17TABH
	Safety Glass	155350-21	Model J-17TAWH



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

1. Pre-set the horizontal lock trimmer (B1) ½ turn from full tight. Adjust the horizontal hold control (R3) and the horizontal frequency slug (B2) until the picture synchronizes horizontally.

2. Connect the vertical amplifier of an oscilloscope thru a 10MMF capacitor to point Ⓓ. Connect low side to chassis. Adjust the horizontal waveform slug (B3) so that peaks are equal as in Fig. 5. Keep the picture in sync by readjusting the horizontal hold and B2 while adjusting B3.

3. Turn the horizontal hold control fully counter clockwise and adjust B2 by turning counter clockwise until the picutre is just out of sync as indicated by 3 to 5 bars.

4. Turn the horizontal hold control clockwise until the picture falls out of sync. (If the picture fails to fall out of sync, momentarily switch off station and back again). Then turn horizontal hold control counter clockwise until the picture just falls into sync and note the number of bars present just before the picture locks in. If there are more than 3 bars present just before locking in, adjust B1 slightly coun ter clockwise. Recheck the number of bars and repeat adjustments of B1 until two or three bars are present.

5. Adjust the horizontal drive trimmer (B4) for a picture of maximum width without the presence of vertical white lines or compression near the center of the picture.

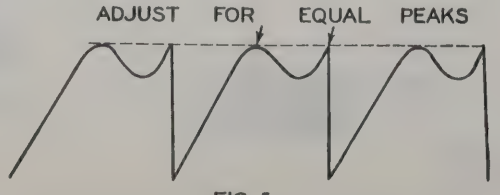


FIG. 5

DAVID BOGEN
MODEL DB130

DAVID BOGEN
MODEL DB130

DAVID BOGEN
MODEL DB130

TRADE NAME	David Bogen Model DB130
MANUFACTURER	David Bogen Co., Inc., 29 Ninth Ave., New York 14, N. Y.
TYPE SET	AC Operated Audio Amplifier
TUBES (EIGHT)	Types 12AX7 Preamplifier, 12AU7 AF Amplifier, 12AX7 AF Amplifier, 6CG7 AF Amplifier-Phase Inverter, (2) 6AV5GT Output, 6CG7 Volt. Regulator, 5U4GB Rectifier
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .77 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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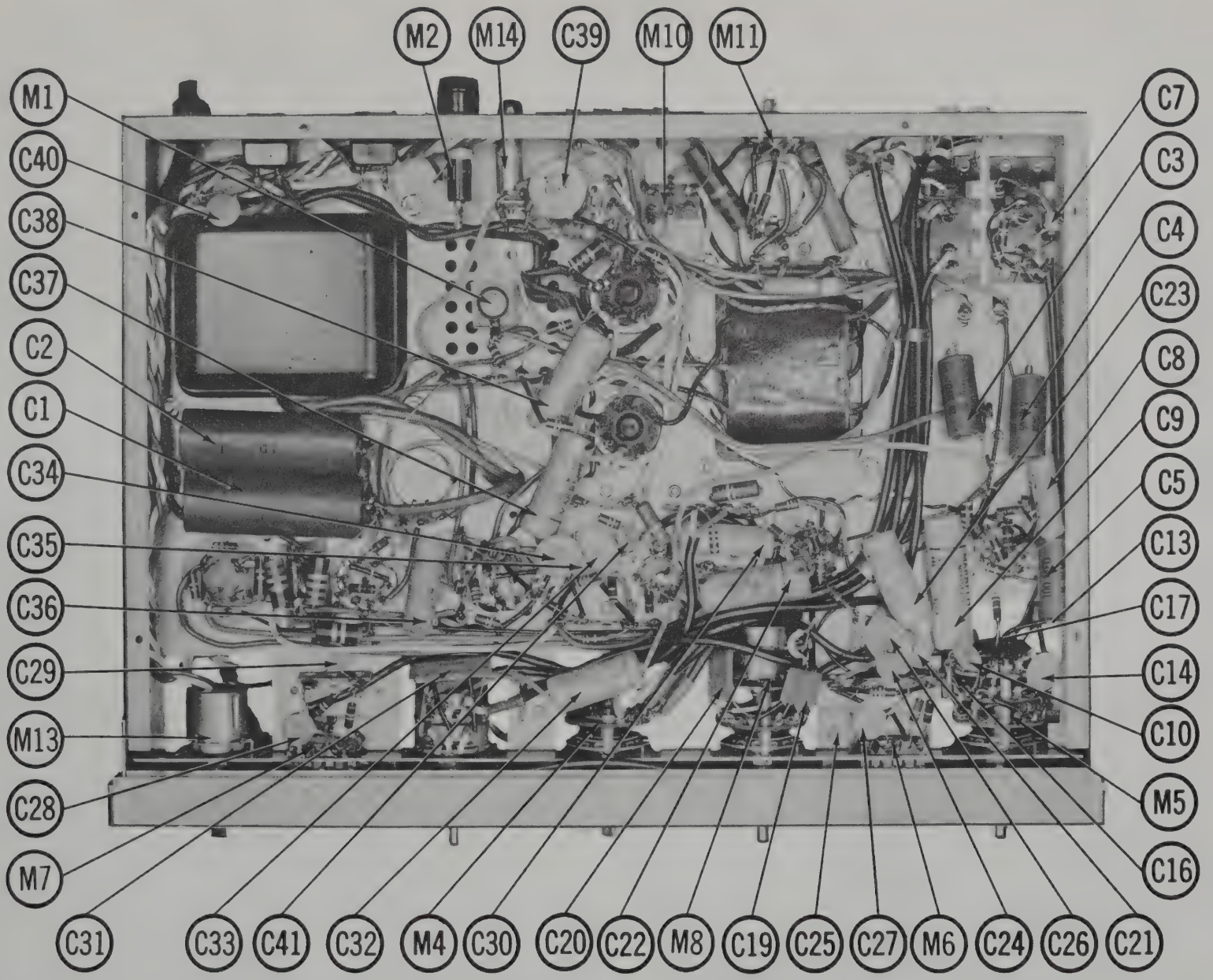
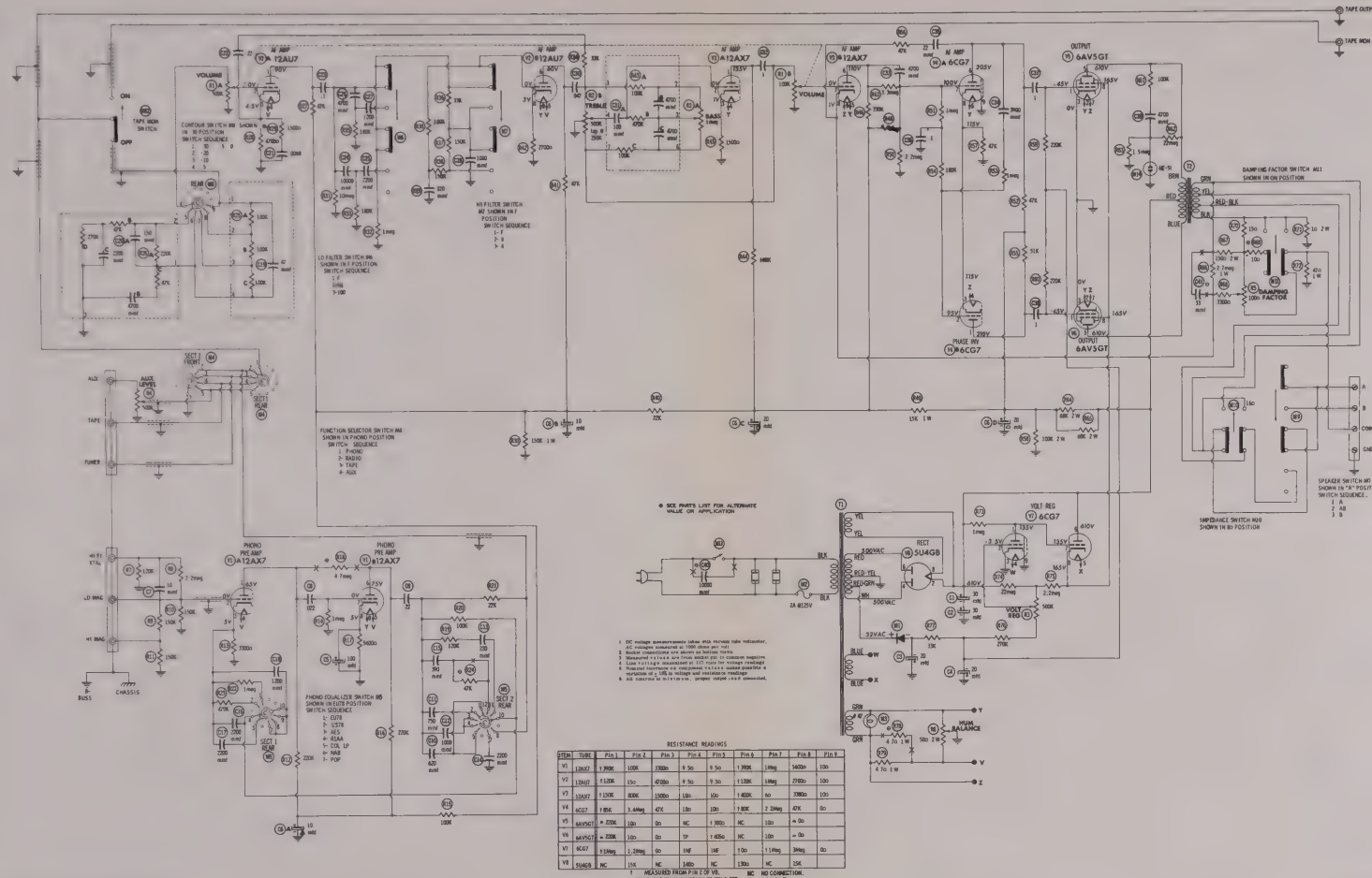


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION


TAPE OUTPUT
TAPE MON
ON
OFF
TAPE MON SWITCH
VOLUME
CONTOUR SWITCH #88
IN 10 POSITION
SWITCH SEQUENCE
1- 10
2- 20
3- 10
4- 5
REAR
SECT
LO FILTER SWITCH #86
SHOWN IN F POSITION
SWITCH SEQUENCE
1- F
2- 100
3- 100
HI FILTER SWITCH #87 SHOWN IN F POSITION
SWITCH SEQUENCE
1- F
2- 8
3- 4
TREBLE
BASS
VOLUME
OUTPUT
6AV5GT
PHASE INV
6CG7
DAMPING FACTOR SWITCH #83
SHOWN IN ON POSITION
DAMPING FACTOR
SPEAKER SWITCH #81
SHOWN IN "A" POSITION
SWITCH SEQUENCE
1- A
2- AB
3- B
IMPEDANCE SWITCH #80
SHOWN IN 8Ω POSITION
A
B
COM
GND
FUNCTION SELECTOR SWITCH #84
SHOWN IN PHONO POSITION
SWITCH SEQUENCE
1- PHONO
2- RADIO
3- TAPE
4- AUX
AUX
TAPE
TUNER
MAIN LEVEL
PHONO PRE AMP
12AX7
PHONO EQUALIZER SWITCH #85
SHOWN IN EUR POSITION
SWITCH SEQUENCE
1- EUR
2- U.S.R
3- AES
4- RIAA
5- COL LP
6- NAB
7- POP
CHASSIS
BUSS
VOLT REG
6CG7
RECT
5U4GB
VOLT REG
HUM BALANCE
SEE PARTS LIST FOR ALTERNATE VALUE ON APPLICATION
RESISTANCE READINGS
ITEM
TUBE
Pin 1
Pin 2
Pin 3
Pin 4
Pin 5
Pin 6
Pin 7
Pin 8
Pin 9
V1
12AX7
1 990K
100K
330Ω
5 So
5 So
1 990K
1Meg
560Ω
10Ω
V2
12AU7
1 100K
15Ω
470Ω
5 So
5 So
1 120K
1Meg
270Ω
10Ω
V3
12AX7
1 150K
820K
1500
10Ω
10Ω
1 400K
Go
330Ω
10Ω
V4
6CG7
1 85K
3.4Meg
47K
10Ω
10Ω
1 80K
2.2Meg
47K
Go
V5
6AV5GT
▲ 200K
10Ω
Go
NC
1 300Ω
NC
10Ω
▲ Go
V6
6AV5GT
▲ 200K
10Ω
Go
TP
1 450Ω
NC
10Ω
▲ Go
V7
6CG7
1 1Meg
1.28Meg
Go
INF
INF
10Ω
1 1Meg
3Meg
Go
V8
5U4GB
NC
15K
NC
340Ω
NC
130Ω
NC
15K
1 MEASURED FROM PIN 2 OF V8.
NC NO CONNECTION.
▲ MEASURED FROM JUNCTION OF #74 & #77.
TP TIE POINT
▲ MEASURED FROM PIN 8 OF V7.
1 DC voltage measurements taken with vacuum tube voltmeter.
2 DC voltage measured to 1969 ohms per volt.
3 Socket connections are shown as bottom views.
4 Measured resistances from socket pin to common negative.
5 Line voltage maintained at 117 volts for voltage readings.
6 Required tolerance on components unless noted otherwise is variation of ± 10% in voltage and resistance readings.
7 All controls in minimum, proper output level unless otherwise noted.
A PHONOFACT STANDARD NOTATION SCHEMATIC
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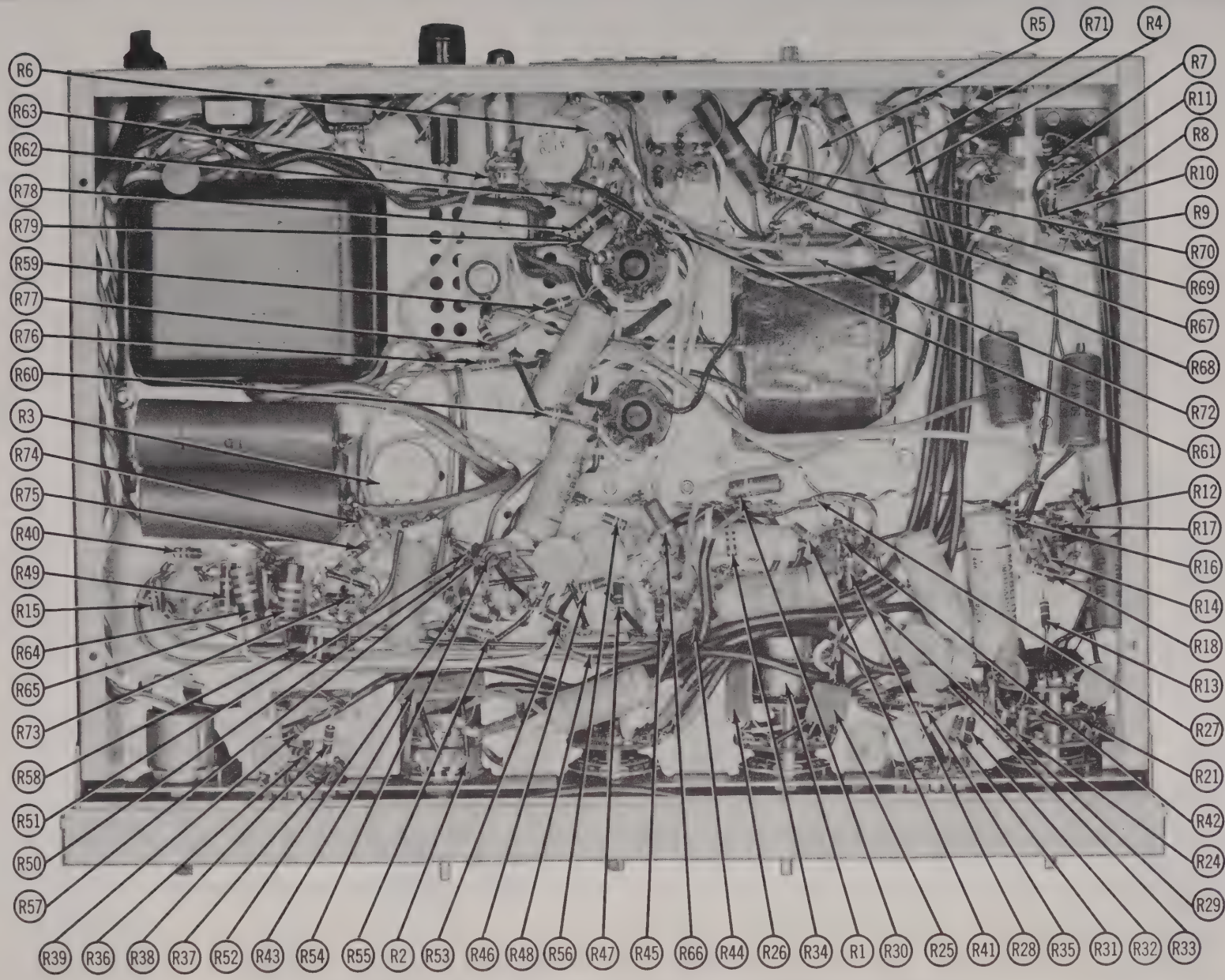
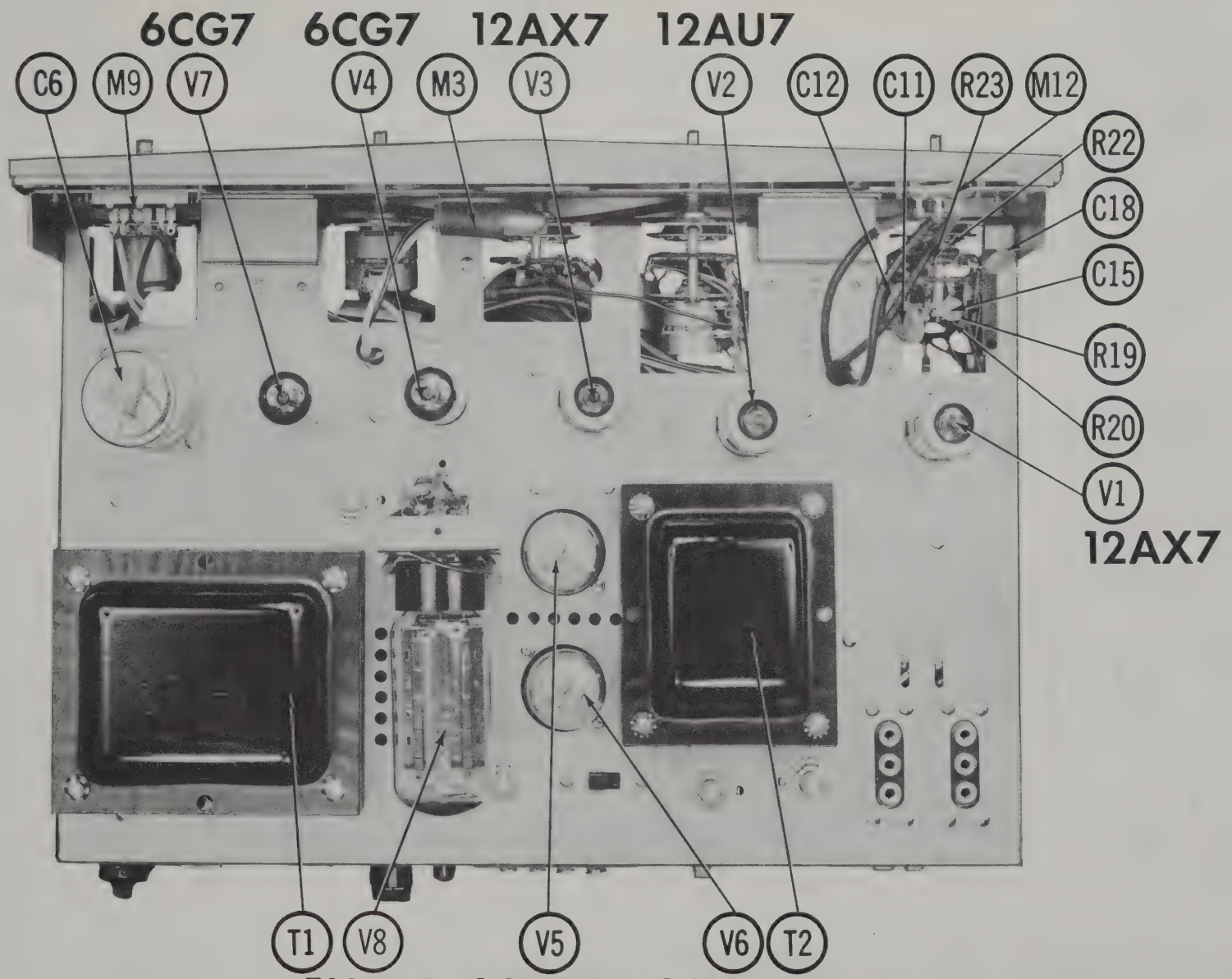
332-4



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. CLAUSING
DENVER, COLORADO

DAVID BOGEN
MODEL DB130



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS
TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	12AX7	
V2	AF Amplifier	12AU7	
V3	AF Amplifier	12AX7	
V4	AF Amp. -Phase Inv.	6CG7	
V5	Output	6AV5GT	
V6	Output	6AV5GT	
V7	Volt Regulator	6CG7	
V8	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA David Bogen PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	30	400			BR3045		TD-30-450	FM-4530	TVA-1711
C2	30	400			BR3045		TD-30-450	FM-4530	TVA-1711
C3	20	50		PRS50V20	BR205	TC36	TD-25-50	FM-0525	TVA-1306
C4	20	50		PRS50V20	BR205	TC36	TD-25-50	FM-0525	TVA-1306
C5	100	6		PRS6V100	BBR100-6	TC2501	TD-100-6	MTH-0610	TVA-1101
C6A	▲10	350		AFH4-19-10	D012	FP474.5	TMQ-11	Q-035	R2290*
B	10	350			BR1235		TD-12-350	FM-3512	
C	■20	450							
D	●20	450							

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C7	10			N750-DI10	TCN-10	N018	N750A-100	NT-541	5TCU-Q1	
C8	.022	400		BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C9	.22	400		P488N-22		CUB4P22		PT4022	4TM-P22	
C10	620			1464-00062		1R5T62			MS-362	
C11	750			1464-00075		1R5T75	811-751		MS-375	
C12	1000			1464-001		1R5D1	811-102	MCB255	MS-21	
C13	220			NP0-SI220	D6-221	TZ38	811-221		MS-322	
C14	2200			1464-0022		1R5D22			MS-222	
C15	390				D6-391	5R5T39	811-391		MS-339	
C16	2200			1464-0022		1R5D22			MS-222	
C17	2200			1464-0022		1R5D22			MS-222	
C18	1200			1464-0012		1R5D12	811-122		MS-212	
C19	47		†	NP0-DI47	D6-470	Z033	831-470	ZT-5447	†104C11	
C20A	150			1469-00015		22R5T15				
B	4700		♦	1464-0047		1R5D47			♦102C22	
C	2200			1464-0022		1R5D22				
C21	.0068	600		BPD-0068	D6-682	CUB6D68	GP2-333-682	PT6268	6TM-D68	
C22	.22	200		P288N-22		CUB2P22		PT4022	2TM-P22	
C23	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C24	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C25	2200			1464-0022		1R5D22			MS-222	
C26	4700			1464-0047		1R5D47			MS-247	
C27	1200			1464-0012		1R5D12	811-122		MS-212	
C28	1000			1464-001		1R5D1	811-102	MCB255	MS-21	
C29	220			NP0-SI220	D6-221	TZ38	811-221		MS-322	
C30	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C31A	100			1469-0001		22R5T1			MS-31	
B	4700		‡	1464-0047		1R5D47			MS-247	
C	4700			1464-0047		1R5D47			MS-247	
C32	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C33	4700			1464-0047		1R5D47			MS-247	
C34	3900			1464-0039		1R5D39			MS-239	
C35	22			NP0-DI22	D6-220	Z024	831-220		5TCC-Q22	
C36	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C37	.1	600		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C38	.1	600		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C39	4700			1464-0047		1R5D47			MS-247	
C40	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	Note 1
C41	33									Note 1

† Items C19, R25A, R25B and R25C are combined in one unit.
♦ Items C20A, C20B, C20C, R26A, R26B, R26C and R26D are combined in one unit.
‡ Items C31A, C31B, C31C, R43A, R43B and R43C are combined in one unit.
Note 1: Not used in some versions.

PARTS LIST AND DESCRIPTIONS (Continued)
CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA David Bogen PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	1/2				Q13-133		Volume
B	100K	1/2				M13-128		Volume
C	Shaft					RQ		
R2A	1Meg	1/2	V371A	F1-51			UF16L	Bass (Panel)
B	500K	1/2		R2-46			UR55-T254	Treble tapped at 250K (Rear)
R3A	500K	1/2	V275B	AB-60	A47-500K-Z	Q13-133	TA55A	Voltage Regulator
B	Shaft		Not Req.	AK-1	FKS-1/4	RQ		Attach to R3A
R4A	500K	1/2	V275B	AB-60	A47-500K-Z	Q13-133	U48	Auxiliary Level
B	Shaft		Not Req.	AK-1	FKS-1/4	RQ		Attach to R4A
R5	100Ω	1/2	V388			WPK100	R100L	Damping Factor
R6A	50Ω	2	V113		A43-50	WPK50	C50P	Hum Balance (Wire-wound)
B	Shaft		Not Req.		FKS-1/4	Not Req.	Not Req.	Attach to R6A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA David Bogen PART No.	IRC PART No.	NOTES
R7	120K			BTS-120K	
R8	2.2Meg			BTS-2.2Meg	
R9	150K			BTS-150K	
R10	150K			BTS-150K	
R11	150K			BTS-150K	
R12	220K			MBC-220K	Note 1
R13	3300Ω			BTS-3300	
R14	1Meg			BTS-1Meg	
R15	100K			BTS-100K	
R16	220K			MBC-220K	Note 1
R17	5600Ω			BTS-5600	
R18	4.7Meg			BTS-4.7Meg	Note 2
R19	120K			BTS-120K	
R20	100K			BTS-100K	
R21	22K			BTS-22K	
R22	1Meg			BTS-1Meg	
R23	470K			BTS-470K	
R24	47K			BTS-47K	
R25A	100K		†	BTS-100K	
B	100K			BTS-100K	
C	100K			BTS-100K	
R26A	220K		♦	BTS-220K	
B	47K			BTS-47K	
C	47K			BTS-47K	
D	270K			BTS-270K	
R27	47K			BTS-47K	
R28	4700Ω			BTS-4700	
R29	1500Ω			BTS-1500	Note 3
R30	150K	1		BTA-150K	
R31	10Meg			BTS-10Meg	
R32	1Meg			BTS-1Meg	
R33	180K			BTS-180K	
R34	33K			BTS-33K	
R35	180K			BTS-180K	
R36	33K			BTS-33K	
R37	150K			BTS-150K	
R38	150K			BTS-150K	
R39	100K			BTS-100K	
R40	22K			BTS-22K	
R41	47K			BTS-47K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA David Bogen PART No.	IRC PART No.	NOTES
R42	2700Ω			BTS-2700	
R43A	100K		‡	BTS-100K	
B	470K			BTS-470K	
C	100K			BTS-100K	
R44	100K			BTS-100K	
R45	1500Ω			BTS-1500	
R46	330K			BTS-330K	
R47	3.3Meg			BTS-3.3Meg	
R48	1.8Meg			BTS-1.8Meg	
R49	15K	1		BTA-15K	
R50	2.2Meg			BTS-2.2Meg	
R51	1Meg			BTS-1Meg	
R52	47K			BTS-47K	
R53	1Meg			BTS-1Meg	
R54	180K			BTS-180K	
R55	51K 5%			BTS-51K 5%	
R56	47K			BTS-47K	
R57	47K			BTS-47K	
R58	100K	2		BTB-100K	
R59	220K			BTS-220K	
R60	220K			BTS-220K	
R61	100K			BTS-100K	
R62	22Meg			BTS-22Meg	
R63	1.5Meg			BTS-1.5Meg	
R64	68K	2		BTB-68K	
R65	68K	2		BTB-68K	
R66	2.7Meg	1		BTA-2.7Meg	
R67	150Ω	2		BTB-150	
R68	3300Ω			BTS-3300	
R69	10Ω			BTS-10	Note 4
R70	15Ω			BTS-15	
R71	1Ω	2		BW2-1	
R72	.47Ω	1		BW1-.47	
R73	1Meg			BTS-1Meg	
R74	22Meg			BTS-22Meg	
R75	2.2Meg			BTS-2.2Meg	
R76	270K			BTS-270K	
R77	33K			BTS-33K	
R78	4.7Ω	1		BW1-4.7	Note 5
R79	4.7Ω	1		BW1-4.7	Note 2

† Items R25A, R25B, R25C, C19 are combined in one unit.
♦ Items R26A, R26B, R26C, R26D, C20A, C20B, and C20C are combined in one unit.
‡ Items R43A, R43B, R43C, C31A, C31B and C31C are combined in one unit.
Note 1: Low noise deposited carbon resistor.
Note 2: Not used in some versions.
Note 3: Some versions use 2200Ω resistor in this application.
Note 4: Some versions use 15Ω resistor in this application.
Note 5: Some versions use 2.7Ω 1W resistor in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .77A	1020VCT @ .043A Tap @ 32V @ .0035A	5VAC @ 3A	6.3VAC @ 3.8A SEC. 4 6.3VAC @ .6A	T3137					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	11.4K	16Ω & 8Ω	T2119						

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	David Bogen PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.0035A	H373	1263A	RS065Q	8S35	8J1	50	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			David Bogen PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG S/B	2A 125V			313002, (3AG-S/B-2A)	342001	MDL2	HKP

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M3	Pilot Light		#47
M4	Switch	S457A	Selector (Rotary, Wafer Type)
M5	Switch	S465	Phono Equalizer (Rotary, Wafer Type)
M6	Switch	S466	Lo Filter (3 Position - Slide Type)
M7	Switch	S466	Hi Filter (3 Position - Slide Type)
M8	Switch	S456A	Contour (SP-5Position; Rotary, Wafer Type)
M9	Switch	S466	Speaker Selector (3 Position - Slide Type)
M10	Switch	S381	Speaker Impedance Selector (DPDT - Slide Type)
M11	Switch	S381	Damping Factor (DPDT - Slide Type)
M12	Switch	S381	Tape Monitor (DPDT - Slide Type)
M13	Switch	S458	On-Off (Power) SPST
M14	Neon Bulb		NE-51, Damping Factor Indicator

PARTS LIST AND DESCRIPTIONS (Continued)

PERMA MEMBER

EMERSON
MODEL 842

EMERSON
MODEL 842

TRADE NAME	Emerson Model 842
MANUFACTURER	Emerson Radio & Phono Corp., 14th & Coles Streets, Jersey City 2, N. J.
TYPE SET	Battery Operated Portable Transistor AM Superheterodyne Receiver
POWER SUPPLY	9 Volts "A" Supply
RATING	11 MA @ 9 Volts DC
TUNING RANGE—BROADCAST	540KC - 1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to junction of L1 and C5. Low	455KC (400~ mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.		Loop	1650KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal.	"	A5	"
4.		"	600KC	Tune to 600KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Rock tuning gang while adjusting for maximum output. Repeat steps 2, 3 & 4 until no further improvement is obtained.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1956 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under international Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

EMERSON MODEL 842

TRANSISTORS

ITEM No.	USE	TYPE	NOTES
X1	Converter	830	
X2	1st IF Amplifier	961588	Note 1
X3	2nd IF Amplifier	961588	Note 1
X4	AF Amplifier	961592	
X5	Output	961590	Note 2
X6	Output	961590	Note 2

Note #1. 2N145 or 2N147 may be used in some versions. Replace with original type.
Note #2. X5 and X6 are a matched pair.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	EMERSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	100	15	961572	SRE15V100	BBR100-15		TD-100-15		TVA-1160
C2	10	5	961573	SRE25V10	BBR10-25	TAP25-10	TD-10-25	MMT-0210	TE-1087
C3	10	5	961574	SRE25V10	BBR10-25	TAP25-10	TD-10-25	MMT-0210	TE-1087
C4	50	3	961575	SRE3V50	BBR50-3		TD-50-6	MMT-350	TVA-1100

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C6	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C7	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C8	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C9	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C10	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C11	1.5			NPO-SD1.5	TCZ-1R5	TZ03	NPOA-1R5	ZT-5515	5TCCB-V15	Note #1.
C12	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C13	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C14	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C15	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	

Note #1. Not Used In Some Versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	5000Ω	½	V310-2	AB-11		Q13-114	U12	Volume
B	Shaft		Not Req.	AK-4		Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-1		76-1	US-26	Attach to R1A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON PART No.	IRC PART No.	
R2	100K			BTS-100K	
R3	470Ω			BTS-470	
R4	2200Ω			BTS-2200	
R5	4700Ω			BTS-4700	
R6	330Ω			BTS-330	
R7	47K			BTS-47K	
R8	6800Ω			BTS-6800	
R9	220Ω			BTS-220	
R10	470Ω			BTS-470	

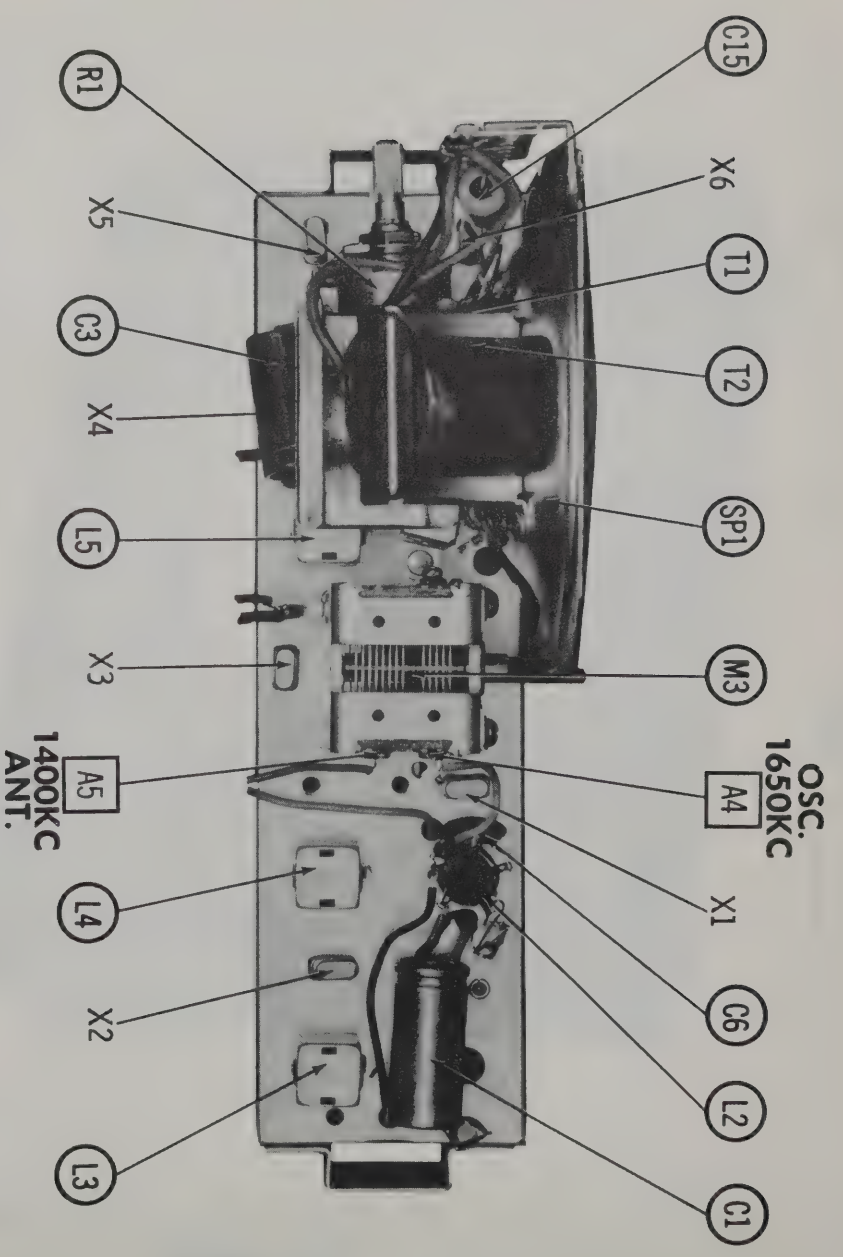
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON PART No.	IRC PART No.	
R11	100K			BTS-100K	
R12	2200Ω			BTS-2200	
R13	6800Ω			BTS-6800	
R14	33K			BTS-33K	
R15	1000Ω			BTS-1000	
R16	100Ω			BTS-100	
R17	82Ω			BTS-82	Note 1
R18	4700Ω			BTS-4700	
R19	10Ω			BTS-10	

Note 1. Some versions use 68Ω in this application.

TRANSFORMER (AUDIO INPUT)

ITEM No.	RESISTANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	310Ω	168Ω CT	961583						
	Turns Ratio 2:	1							

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	800Ω	3-4Ω	961584						

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	EMERSON PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	961585	4A07	223S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	EMERSON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	.1Ω	1.1Ω	961579				
L2	Osc. Coil	1.9Ω	*3.9Ω	961581				*Tapped ⓐ .2Ω
L3	1st IF	■9.2Ω	.4Ω	961582				■ Tapped ⓐ 2.5Ω
L4	2nd IF	■9.2Ω	.4Ω	961582				■ Tapped ⓐ 2.5Ω
L5	3rd IF	▲9Ω	.8Ω	961583				▲ Tapped ⓐ 2.1Ω

BATTERIES

ITEM No.	VOLTAGE	EMERSON PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	9V			276			D6		Connect 2 in parallel.

CRYSTAL DIODES

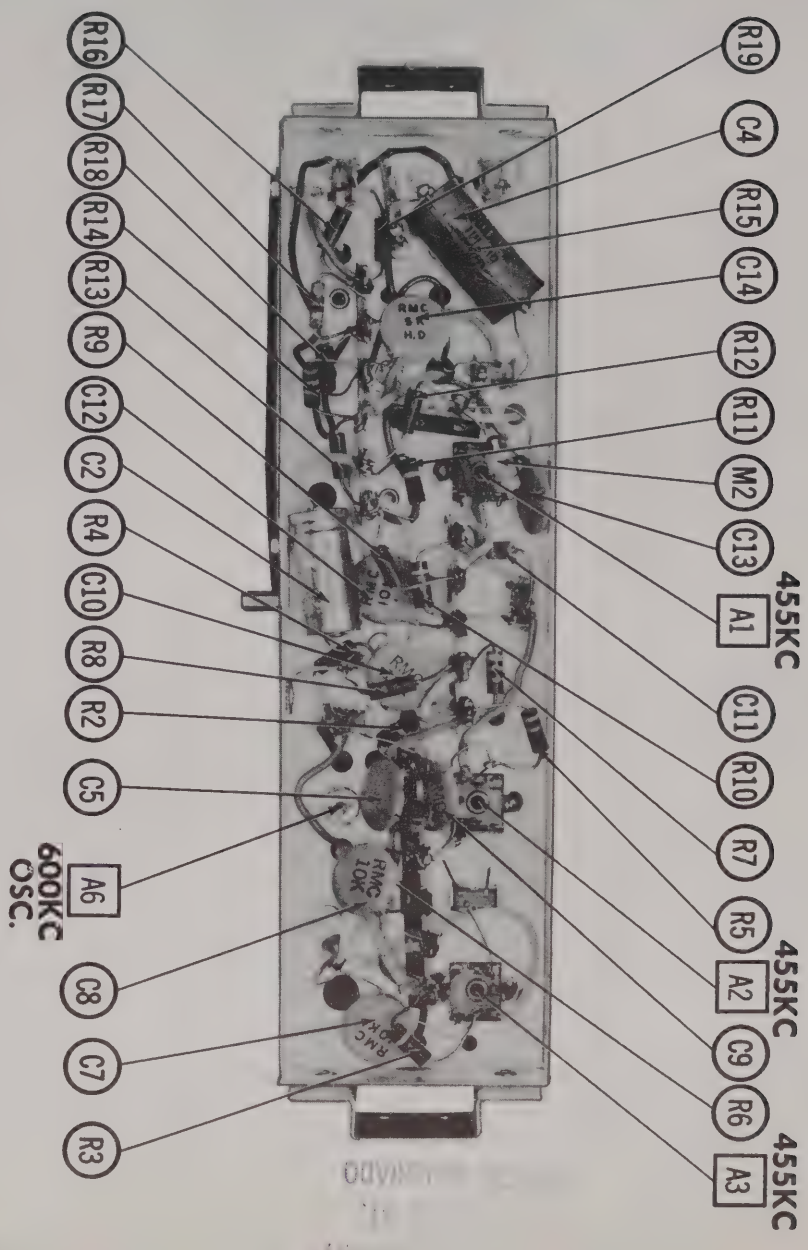
ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		EMERSON PART No.	SYLVANIA PART No.	
M2	1N60*	961591	1N60	Audio Det. (Pigtail)

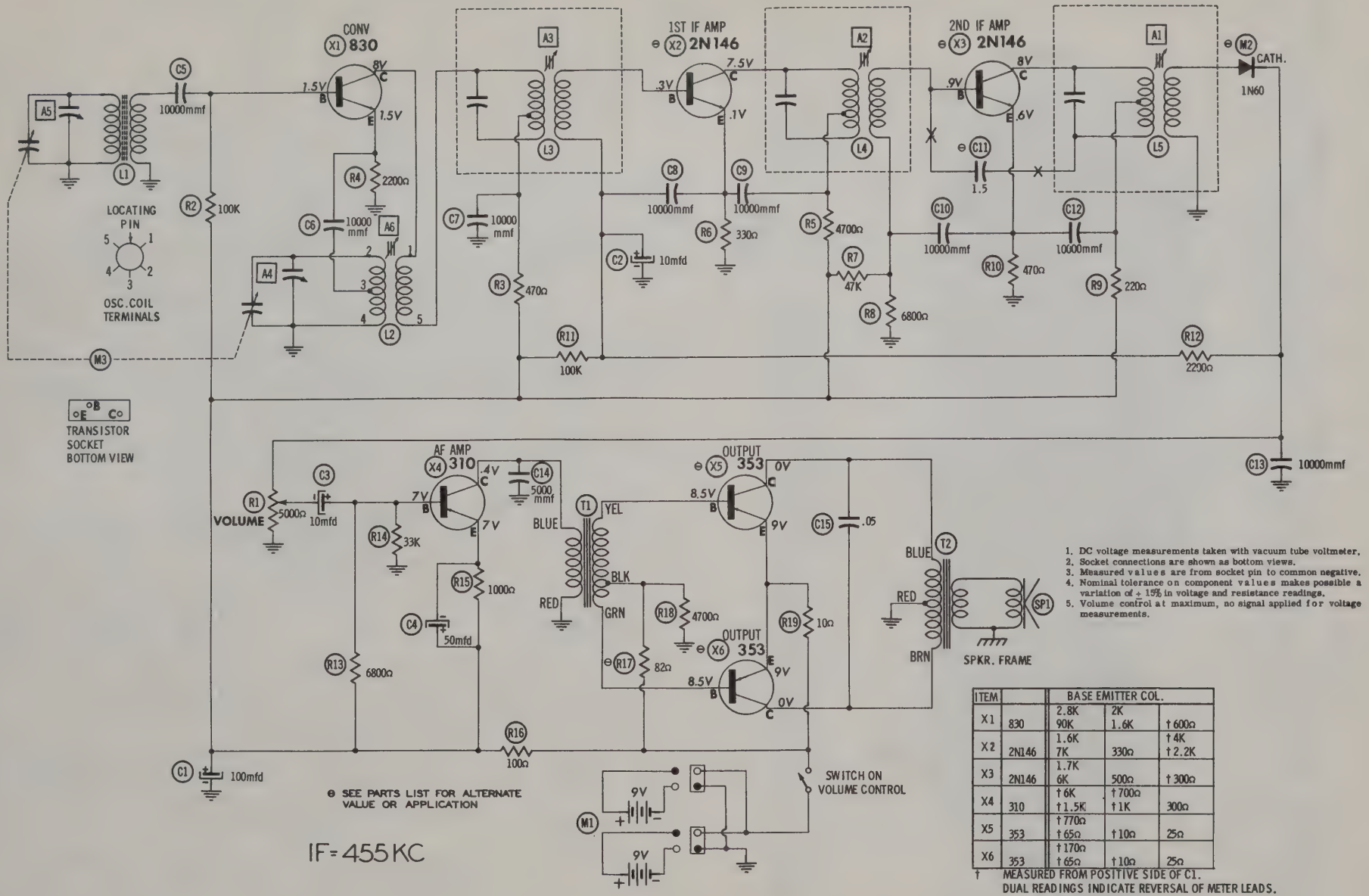
*Some Versions May Use Crystal Diode Type 1N295 Or 1N64 In This Application.

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	Tuning Cap.	961593	2 Gang (16-220MMF, 22-120MMF.)
	Cabinet	961586	
	Knob	460720	Tuning
	Knob	460588	On-Off-Volume

CHASSIS—BOTTOM VIEW




CONV
X1 830
1ST IF AMP
X2 2N146
2ND IF AMP
X3 2N146
AF AMP
X4 310
OUTPUT
X5 353
OUTPUT
X6 353
CATH.
1N60
LOCATING PIN
OSC. COIL TERMINALS
TRANSISTOR SOCKET BOTTOM VIEW
VOLUME
SPKR. FRAME
SWITCH ON VOLUME CONTROL
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
IF = 455 KC
1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

ITEM		BASE EMITTER COL.		
X1	830	2.8K 90K	2K 1.6K	†600Ω
X2	2N146	1.6K 7K	330Ω	†4K †2.2K
X3	2N146	1.7K 6K	500Ω	†300Ω
X4	310	†6K †1.5K	†700Ω †1K	300Ω
X5	353	†770Ω †65Ω	†10Ω	25Ω
X6	353	†170Ω †65Ω	†10Ω	25Ω

† MEASURED FROM POSITIVE SIDE OF C1.
DUAL READINGS INDICATE REVERSAL OF METER LEADS.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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FADA MODELS DL400K, KD, KLO, T, TB, TBLO, TLO, UDL400K, KD, KLO, T, TB, TBLO, TLO

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FADA MODEL DL400T

TRADE NAME	Fada	MODELS DL400K, DL400KD, DL400KLO, DL400T, DL400TB, DL400TBLO, DL400TLO, UDL400K, UDL400KD, UDL400KLO, UDL400T, UDL400TB, UDL400TBLO, UDL400TLO
MANUFACTURER	Fada Radio & Electric Co., Inc., 525 Main St., Belleville, N.J.	
TYPE SET	Television Receiver	
TUBES	Seventeen	
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 1.48 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) * Channels 2 thru 13 , Video IF 26.1MC, Sound IF 21.6MC (Intercarrier)	

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Tube Placement Chart (Top View) 5

* ALL CHASSIS WITH THE LETTER "C" STAMPED ON REAR APRON OF CHASSIS DENOTES THAT CHASSIS USES A 21MC IF SYSTEM.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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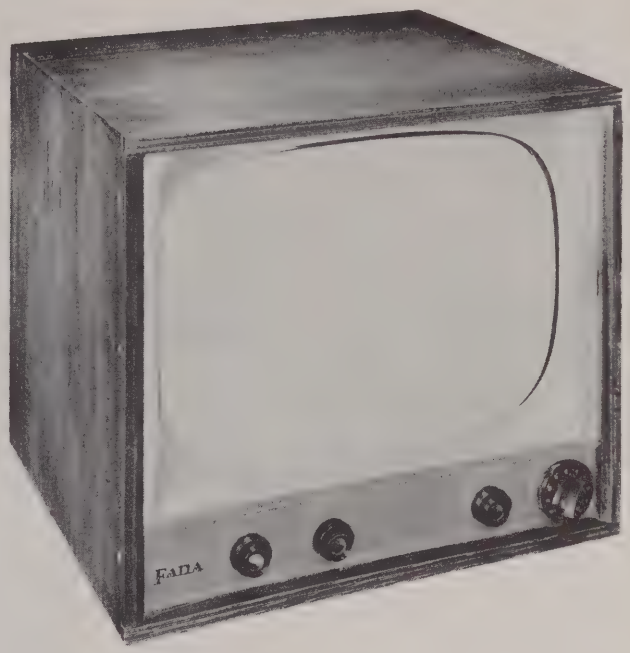
FADA MODELS DL400K, KD, KLO, T, TB, TBLO, TLO, UDL400K, KD, KLO, T, TB, TBLO, TLO

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs from front panel of cabinet.
2. Remove 7 wood screws. Remove rear cover.
3. Remove speaker leads, picture tube socket, HV lead and ground lead.
4. Remove ion trap.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 2 wing nuts. Remove speaker.



MODEL DL400T

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 6 wood screws (3 from each side) holding 2 wood strips located on each side of the safety glass. Remove wood strips and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-range position and adjust the horizontal frequency slug (L15) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L13) located on top of the chassis.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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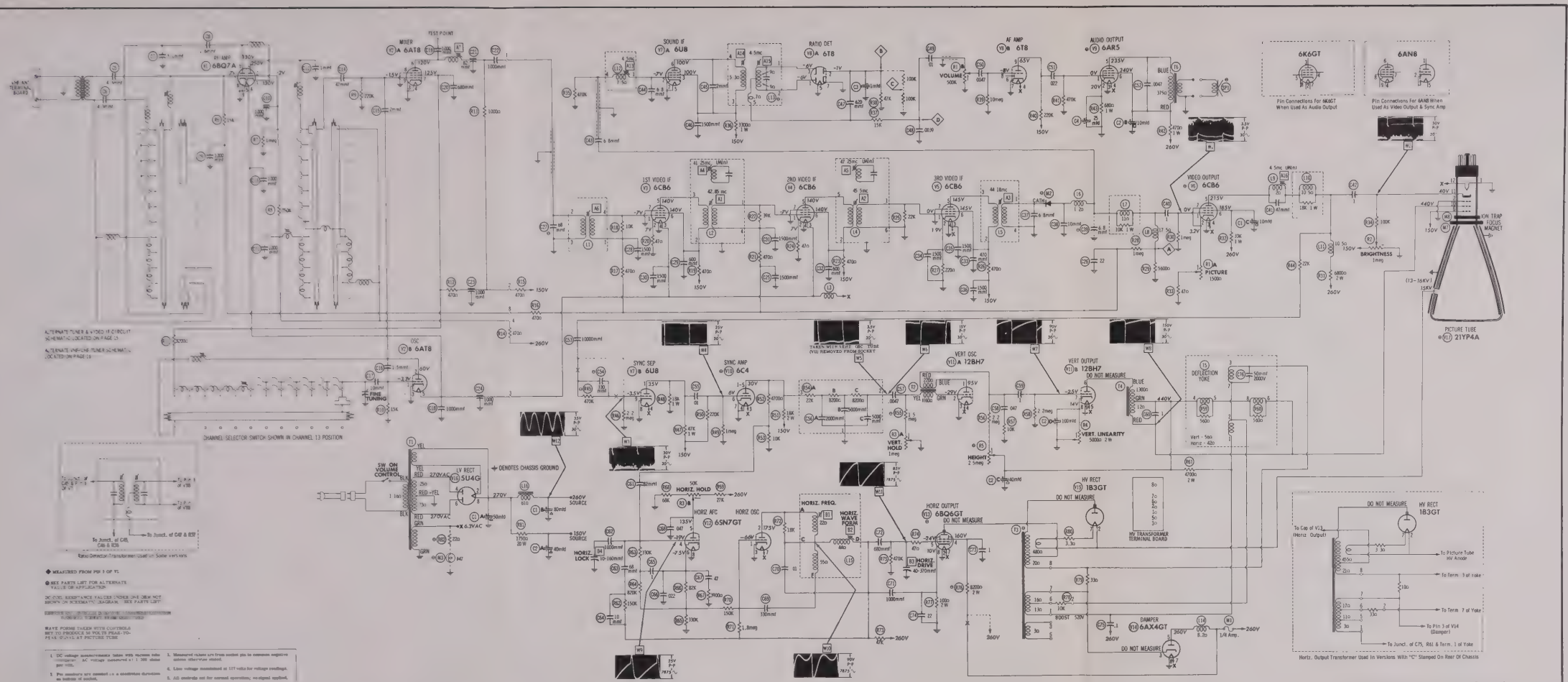

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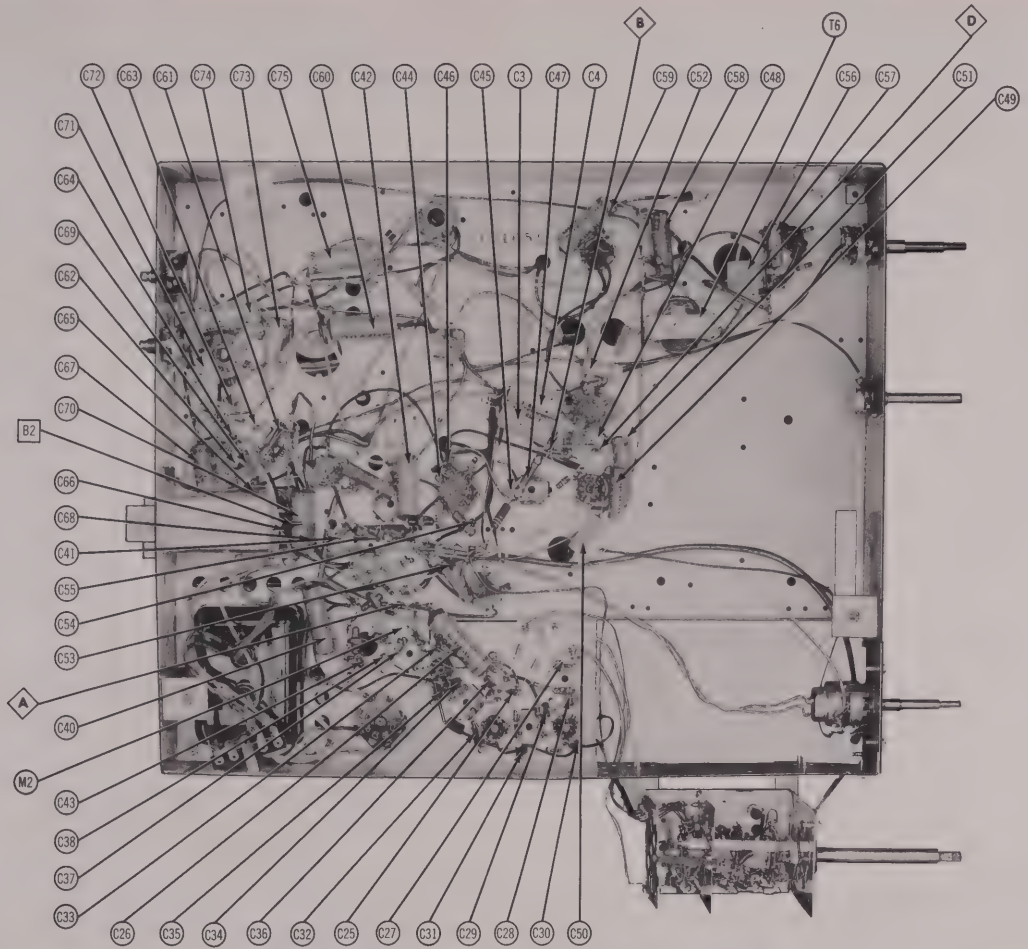
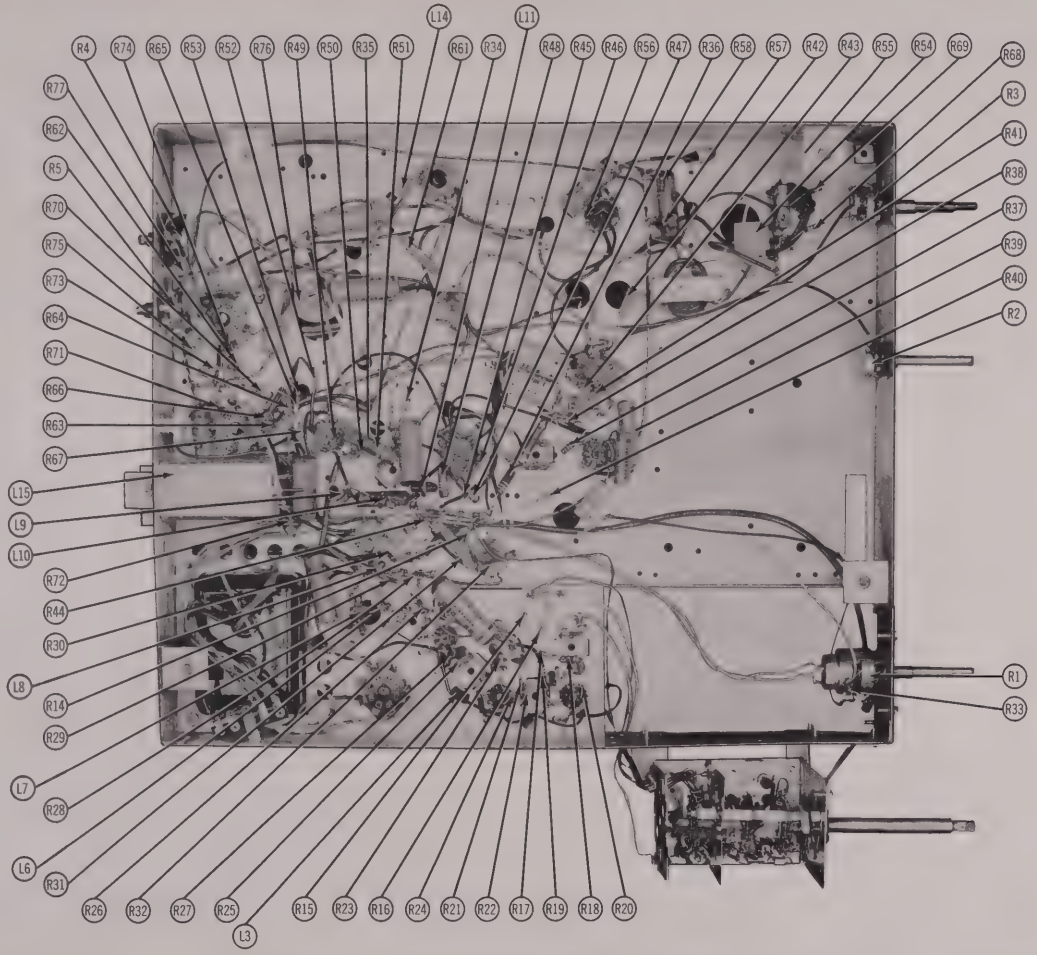
FADA MODELS DL400K, KD, KLO, T, TB, TBLO, TLO, UDL400K, KD, KLO, T, TB, TBLO, TLO

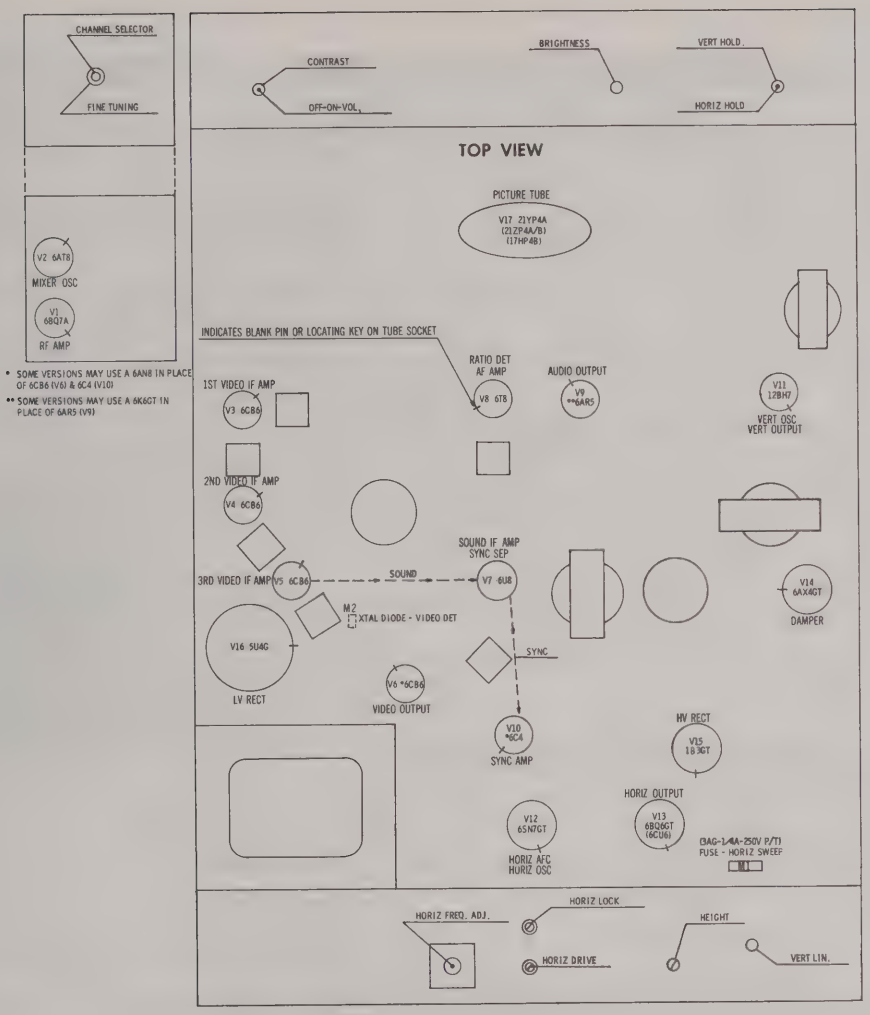


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V16**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V17**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V10, V11**
No horiz. sync - **V10, V12**
No vert. or horiz. sync - **V7, V10**

SWEEP FAILURE
No raster, has sound - **V12, V13, V14, V15, V17, Fuse (M1)**
No vertical deflection - **V11**
Poor vert. linearity or foldover - **V11**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, V15, V16**
Vert. off freq. - **V10, V11**
Horiz. off freq. - **V10, V12**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped away from the chassis. Do not remove the horizontal oscillator (V12) to disable the high voltage.

VIDEO IF ALIGNMENT FOR 41MC IF CHASSIS

Connect the negative lead of a 4.5 volt bias supply to the ungrounded side of C26. Positive to chassis.
Set the contrast control for minimum contrast.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD Ceramic capacitor	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis. Use short leads.	42.85MC (unmod)	Any non-interfering channel	DC probe thru 47K to point (A). Common to chassis.	A1	Attenuate generator output to maintain not more than 2 volts at VTVM. Adjust for maximum deflection.
2.	"	"	45.5MC	"	"	A3	"
3.	"	"	44.1MC	"	"	A3	"
4.	"	"	41.25MC	"	"	A4	Adjust for MINIMUM deflection.
5.	"	"	47.25MC	"	"	A5	Adjust for MINIMUM deflection. Repeat steps 1 thru 5.

FIG. 1

FIG. 2

OVERALL VIDEO IF RESPONSE CHECK FOR 41MC IF CHASSIS

Leave bias connected as under "Video IF Alignment For 41MC IF Chassis"
If a separate marker generator is used, connect the high side fo the chassis apron near the first video IF stage. Leave the low side disconnected.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.001MFD Ceramic capacitor	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis. Use short leads.	44MC (10MC Swp)	41.25MC 42.25MC 45.75MC 47.25MC	Any non-interfering channel	Vert. amp. thru 15K to point (A). Low side to chassis		Check for response similar to Fig. 1. If necessary, retouch A1, A2 and A3 to obtain desired response. Use only enough sweep generator output to provide usable pattern on scope.
7.	Direct	High side to an ungrounded tube shield floating over converter tube. Low side to chassis.	"	"	"	"	A6, A7	Adjust A6 and A7 for maximum response at center of bandpass (44MC) and to position the 42.25MC and 45.75MC markers as in Fig. 3. If necessary, SLIGHTLY retouch A1, A2 and A3 to obtain desired response.

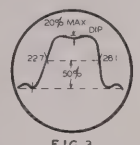


FIG. 3

FIG. 4

VIDEO IF ALIGNMENT FOR CHASSIS WITH LETTER "C" IMPRINTED ON REAR APRON

Connect the negative lead of a 4.5 volt bias supply to point (X). Positive to chassis.
Set the contrast control for minimum contrast.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube. Low side to chassis.	51.6MC (unmod)	Any non-interfering channel.	DC probe thru 47K to point (A). Common to chassis.	A8	Adjust for MINIMUM deflection.
2.	"	"	23.25MC	"	"	A9, A10	Use only enough generator output to provide usable indication on VTVM. Adjust for maximum deflection.
3.	"	"	25.7MC	"	"	A11, A12	"

FIG. 5

OVERALL VIDEO IF RESPONSE CHECK FOR CHASSIS WITH LETTER "C" IMPRINTED ON REAR APRON

Leave bias connected as under "Video IF Alignment".
If a separate marker generator is used, connect the high side to the chassis apron near the first video IF stage. Leave the low side disconnected.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to an ungrounded tube shield floating over converter tube. Low side to chassis.	24MC (10MC Swp)	21.6MC 22.7MC 26.1MC	Any non-interfering channel.	Vert. amp. thru 47K to point (A). Low side to chassis.		Check for response similar to Fig. 3. If necessary, retouch A9 thru A12 for desired response. Adjust A11 and A12 to place 26.1MC marker on response curve. Adjust A9 and A10 to place 22.7MC marker on response curve.

Proceed with step 8.

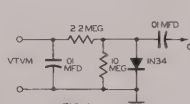


FIG. 6

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (+ 5%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (unmod)	Any	DC probe thru 47K to point (B). Low side to chassis.	A13, A14	Adjust for maximum deflection.
9.	"	"	"	"	DC probe thru 47K to point (C). Common to point (X).	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

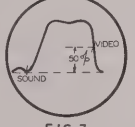


FIG. 7

FIG. 8

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 80% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. thru 47K to point (B). Low side to chassis.	A13, A14	Disconnect stabilizing capacitor (C3). Adjust for curve of maximum amplitude and symmetry similar to Fig. 4.
11.	"	"	"	"	"	Vert. amp. thru 47K to point (B). Low side to chassis.	A15	Reconnect C3. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 5. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Set the contrast control maximum clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (unmod)	Any	DC probe thru detector (Fig. 6) to pin 11 (cathode) of picture tube	A16	Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT FOR TUNER 42.75A

Leave bias connected as under "Video IF Alignment". Reduce bias to 3 volts.
The channel oscillator adjustment screws are reached through a hole in the front of the tuner. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 47K to point (A). Low side to chassis.	A17	Adjust to place sound marker in trap notch as in Fig. 7. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A18	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A19	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A20	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A21	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A22	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A23	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A24	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A25	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A26	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A27	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A28	

RF AND MIXER ALIGNMENT FOR TUNER 42.75A

Leave bias connected as under "Video IF Alignment". Reduce bias to 3 volts.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp. thru 10K to point (A). Low side to chassis.	A29, A30, A31	Adjust for response curve similar to Fig. 8 with markers above 90%.
15.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 8. If markers fall below 70% on any channel, make compromise adjustments of A29, A30 and A31 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

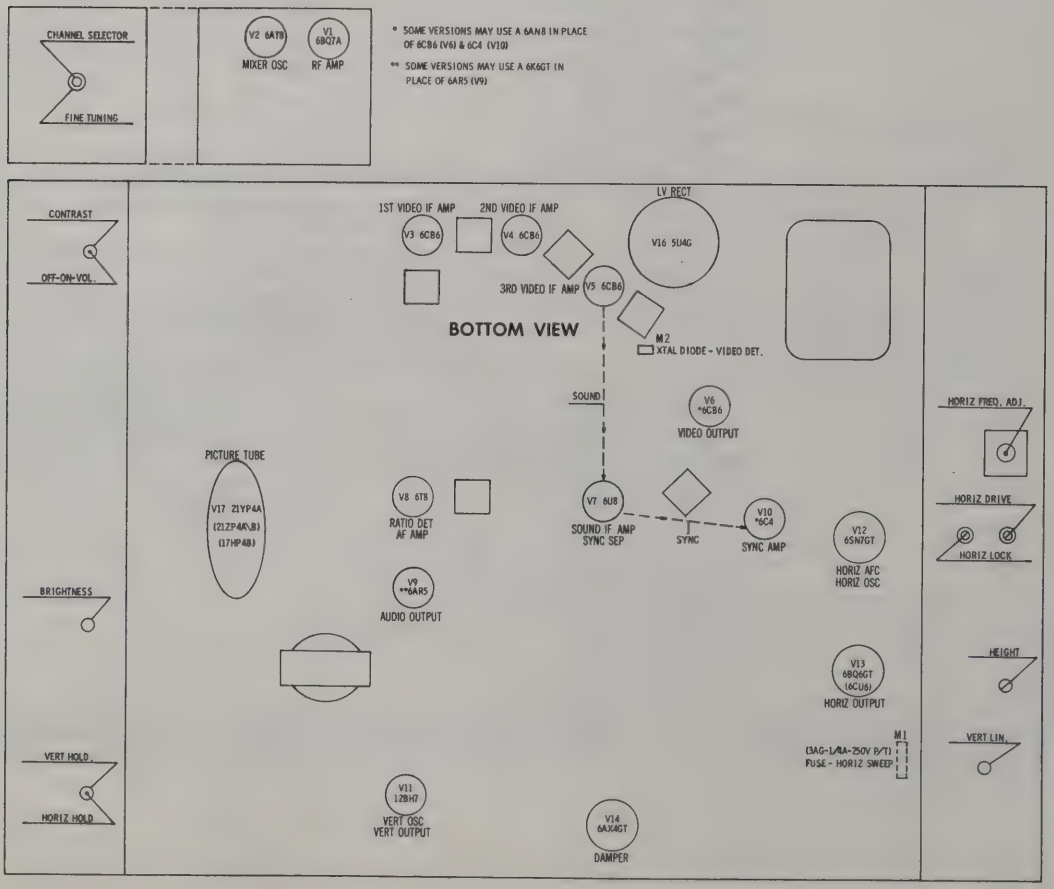
TUNER ALIGNMENT FOR TUNERS 42, 87 AND 42, 88

This portion of the receiver have been properly aligned at the factory and are very stable. Alignment of this portion should not be required in the field.

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BQ7A	†530Ω	400K	INF	.1Ω	0Ω	INF	1Meg	0Ω	0Ω
V2	6AT8	15K	†11K	0Ω	.1Ω	0Ω	†3200Ω	†2800Ω	0Ω	220K
V3	6CB6	1Meg	47Ω	.1Ω	0Ω	†2200Ω	†2200Ω	0Ω		
V4	6CB6	1Meg	47Ω	.1Ω	0Ω	†2200Ω	†2200Ω	0Ω		
V5	6CB6	.2Ω	220Ω	.1Ω	0Ω	†2200Ω	†2200Ω	0Ω		
V6	6CB6	1Meg	● 300Ω	0Ω	.1Ω	†6800Ω	†33K	● 300Ω		
V7	6U8	†22K	470K	†5000Ω	.1Ω	0Ω	†5000Ω	0Ω	0Ω	2.2Meg
V8	6T8	INF	47K	INF	.1Ω	0Ω	NC	0Ω	10Meg	†220K
V9	6AR5	470K	680Ω	0Ω	.1Ω	†900Ω	†530Ω	NC		
V10	6C4	†15K	NC	.1Ω	0Ω	†15K	180K	0Ω		
V11	12BH7	▲●2.5Meg	● 2Meg	0Ω	.1Ω	.1Ω	▲6000Ω	2.2Meg	▲600Ω	0Ω
V12	6SN7GT	480K	†47K	0Ω	1.5Meg	†● 30K	350K	.1Ω	0Ω	
V13	6BQ6GT	NC	0Ω	NC	†8200Ω	470K	TP	.1Ω	100Ω	TOP CAP ▲53Ω
V14	6AX4GT	NC	NC	300K	NC	†65Ω	NC	.1Ω	0Ω	
V15	1B3GT	PINS 1-8 HAVE INF RESISTANCE								TOP CAP ▲530Ω
V16	5U4G	NC	20K	NC	25Ω	NC	23Ω	NC	20K	
V17	21YP4A	0Ω	0Ω	PIN 6 †1700Ω	PIN 10 ▲4700Ω	PIN 11 ●†270K	PIN 12 .1Ω			

† MEASURED FROM PIN 8 OF V16.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 3 OF V13.
TP TIE POINT
NC NO CONNECTION.



TUBE PLACEMENT CHART

CHASSIS TOP VIEW

FADA MODELS DL400K, KD, KLO, T, TB, TBLO, TLO,
UDL400K, KD, KLO, T, TB, TBLO, TLO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	6BQ7A	
V2	Mixer-Oscillator	6A7S	
V3	1st Video IF Amplifier	6CB6	
V4	2nd Video IF Amplifier	6CB6	
V5	3rd Video IF Amplifier	6CB6	
V6	Video Output	6CB6	Note 1
V7	Sound IF Amplifier-Sync Separator	6U8	
V8	Ratio Det.-AF Amplifier	6T8	

ITEM No	USE	TYPE	NOTES
V9	Audio Output	6AB5	Note 2
V10	Sync Amplifier	6C4	Note 1
V11	Vert. Osc.-Vert. Output	12BH7	
V12	Horiz.-AFC-Horiz. Osc.	6SN7GT	
V13	Horiz. Output	6BQ6GT	Note 3
V14	Damper	6AX4GT	
V15	HV Rectifier	1B3GT	
V16	LV Rectifier	5U4G	

Note 1 : 6AN8 may be used in some versions.
Note 3. 6K8GT may be used in some versions.
Note 3. 6CU8 may be used in some versions.

PICTURE TUBE

ITEM No	REPLACEMENT DATA: CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V17	21YP4-A ①	21YP4-A ①	21YP4-A ①	① Aluminized
		21YP4	21YP4	② Silver screen "85"
	21ZP4-A ①	21ZP4-A ①	21ZP4-A ①	
		21ZP4-B ①	21ZP4-B ①	
		21ZP4		
	17MP4B ①	17MP4B ①	17MP4B ①	
	17MP4	17MP4	17MP4	
		17MP4	17MP4	

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP	VOLT	REPLACEMENT DATA: FADA PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No	NOTES
C1A	40	350	22 101	AFH3-45-50	DU15	FP385 ①	TMT-192	T-533	R3180 *
B	80	350				TC72		MTD-3520	
C	80	350							
C1A	40	350	22 102	AFH4-87	DU66	FP431-7	TMQ-100	Q-415	TVL-4747
B	40	450							
C	40	450							
D	100	50							
C3	1	150	22 70	PRS450V1	BR415			MMT-4501	R1991 *
C4	25	50	22 66	PRS50V25	BR255	TC36	TD-25-50	FM-0525	TVA-1306

* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING CAP	VOLT	REPLACEMENT DATA: FADA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	4.3									
C6	4.3									
C7	3.1									
C8	3.6									
C9	1000			BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1	
C10	1000			EF-001	1HT7-1000				502C-D1	
C11	1000									
C12	1000			NPO-SL1	TCZ-1	TZ03	NPOA-020			
C13	1000			BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1	
C14	47			N750-S147	TCN-47	TN14	N750K-470	NT-5447	5TCU-Q47	
C15	47			NPO-SD3	TCZ-2R2	Z005	NPOA-020		5TCCB-Y22	
C16	L.5									
C17	1			NP0-SD5	TCZ-10	TZ09	NPOA-100	ZT-541	5TCC-Q5	
C18	1000			BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1	
C19	1000			BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1	
C20	680			2S80	D6-681	TP50	801-681	DC-5368	5GA-T68	
C21	63									
C22	1000			BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1	
C23	1000									
C24	1000									
C25	1500			BPD-0015	DD-152	KD71	801-0015	DC-5215	5HK-D15	
C26	.23	200		P388N-.22		CUBU223		PT4022	2TM-P22	
C27	68			N750-S268	TCN-68	TN18	N750L-680		5TCU-Q68	Note 1
C28	1500			BPD-0015	DD-152	KD71	801-0015	DC-5215	5HK-D15	
C29	1500			S2D15	D6-152	TP49	801-151	DC-5356	5GA-T5	
C30	1500			BPD-0015	DD-152	KD71	801-0015	DC-5215	5HK-D15	
C31	1500			BPD-0015	DD-153	KD71	801-0015	DC-5215	5HK-D15	
C32	600			S2D60	D6-601	TP49	801-151	DC-5356	5GA-T5	
C33	470			S2470	D6-471	TP48	801-471	DC-5347	5GA-T47	
C34	1500			BPD-0015	DD-152	KD71	801-0015	DC-5215	5HK-D15	
C35	1500			BPD-0015	DD-152	KD71	801-0015	DC-5215	5HK-D15	
C36	1500			BPD-0015	DD-153	KD71	801-0015	DC-5215	5HK-D15	
C37	6.8			BPD-068 ②	TCZ-6R8	TZ09	NPOA-6R8	ZT-5568	5TCCB-Y68	
C38	10			NPO-D10	TCZ-10	Z010	NPOA-100	ZT-541	5TCC-Q10	
C39	6.8			NP0-6R8 ②	TCZ-6R8	Z013	NPOA-6R8	ZT-5568	5TCCB-Y68	Note 2
C40	.1	200		P388N-.1		CUBD1P1		PT401	2TM-P1	
C41	47			NPO-S147	TCZ-47	TZ22	N750-S147	NPO-338-47	ZT-5447	5TCU-Q47
C42	1	600		L5-T5		D6-104		CUB4P1	PT401	4TM-P1
C43	8.5			NP0-8S5 ②	TCZ-8R5	TZ08	NPOA-8R5		ZT-5568	5TCCB-Y68
C44	6.8			NP0-6S5 ②	TCZ-6R8	TZ08	NPOA-8R5		ZT-5568	5TCCB-Y68
C45	8			NP0-8S3.2	TCZ-2R2	Z005	NPOA-2R2			5TCCB-Y22
C46	1500			BPD-0015	DD-153	KD71	801-0015		DC-5215	5HK-D15
C47	620			L7.125						
C48	.0039	600		L2.51	S14000	D6-402	CUBD3D39	GP2-333-393	PT939	6TM-D39
C49	01	600		L2.73	BPD-01	D6-103	CUB4E1	GP2-333-103	PT41	4TM-E1
C50	.0047	600		L2.68	BPD-0047	D6-472	CUBD4E47	GP2-333-472	PT947	6TM-D47
C51	023	600		L2.82	BPD-02	DF-203	CUBS223	417-68	PT823	6TM-S23
C52	.0047	600		L2.68	BPD-0047	D6-472	CUBD4E47	GP2-333-472	PT9247	6TM-D47
C53	.0020	600		L2.77	BPD-02	D6-202	CUB4E2		DC-512	5EK-G1
C54	330			L7.164	S3330	D6-331	TP43	GP2K-331	DC-5333	5GA-T33
C55	01	600		L2.73	BPD-01	D6-103	CUB4E1	GP2-333-103	PT41	4TM-E1
C56A	2000									
B	1000			†TA-I50	†PC-100	*125TM2	†1405-01			†V-1
C	5000									
C57	.0047	600		L2.68	BPD-0047	D6-472	CUBD4T47	GP2-333-472	PT9347	6TM-D47
C58	.0047	600		L2.67	BPD-03	DF-303	CUBS647		PT647	6TM-S47
C59	.1	400		L2.75	P488N-1	DF-104	CUB4P1		PT41	4TM-S1
C60	.1	400		L2.75	P488N-1	DF-104	CUB4P1		PT41	4TM-S1
C61	82			L7.160	1469-000082	TCZ-82	TZ26	NPO-337-820		MS-482
C62	2200			L7.159	BPD-002	DD-202	KD69	801-001	DC-521	5HK-D1
C63	68			L7.158	NPO-S268	TCZ-68	TZ16	NPO-337-850		5TCC-Q68
C64	10			L7.71	NPO-S10	TCZ-10	Z010	NPOA-100	ZT-541	5TCC-Q
C65	.1	200		L2.69	P388N-1	DF-104	CUB2P1		PT401	2TM-P1

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING CAP	VOLT	REPLACEMENT DATA: FADA PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No.	MALLORY PART No	SPRAGUE PART No	NOTES
C66	022	400	L2.82	BPD-02	DF-203	CUB4S22	417-68	PT422	2TM-S22	
C67	47	200	L2.92	P388N-47		CUB2P47		PT4047	2TM-P47	
C68	.047	400	L2.67	BPD-05	DF-503	CUB4S47		PT447	4TM-S47	
C69	330	500	17.69	1469-00053	D6-331	1H5731	811-381		MS-333	
C70	01	400	L2.73							
C71	1000	500	17.71	1464-001		1H5J1	811-103	MCB555	MB-31	
C72	660	500	17.39	DI-00068	D6-681	JR5768	811-681	UC-5368	5GA-T68	
C73	1	400	L2.75	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C74	22	200	L2.91	P288N-22		CUB2P22		PT4023	2TM-P23	
C75	1	400	L2.75	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C76	50	2000	17.181	DD50-500		VP4T	1KV-670	DCB504T	850A-Q47	

† Items C56A, C56B, C56C, R54A, R54B and R54C are combined in one unit.
Note 1. USE-VHF models use 816MMF unit (part #17.69) in this application.
Note 2. Not used in some versions.

CONTROLS

ITEM No	RATING RESIST	WATTS	REPLACEMENT DATA: FADA PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No	INSTALLATION NOTES
R1A	1500Ω	1/2	52.79	F1-7		*QJ-736	UF153L	Picture (Panel)
B	500K	1/2		R2-41			UR55A	Volume (Rear)
C	Switch			KB-1			UR-56	Attach to R1B
R2A	1Meg	1/2	52.78	B-83	A47-1Meg-S	QJ1-127	U-54	Brightness
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	1Meg	1/2	53.66	EBSB-510	RTV-1M	**QJ-158	UF15L	Vert. Hold (Panel)
B	50K	2					UR54L	Horiz. Hold (Rear)
R4A	5000Ω	2	52.68	VK-135	A42-5000	WPE5000	R5005L	Vert. Linearity-wire wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R4A
R5A	2.5Meg	1	52.74	A8-83	A47-2.5Meg	QJ1-283	HU-565	Height - Note 1
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R5A
R6A	2.5Meg	1	52.24	A8-83	A47-2.5Meg	QJ2-259	HU-565	Height
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R6A

* Concentrikit Equivalent: K-4 Kit, Base Elements & Shaft: B1T-109 & P8-125 (Panel)
B1J-133 & R1-209 (Rear)
T6-1 (Switch)

** Concentrikit Equivalent: K-3 Kit, Base Elements & Shaft: B1J-137 & P1-126 (Panel)
B1J-133 & R1-210 (Rear)

† Universal Replacement (Mallory exact duplicated part #UR156Q).
Note 1. Some versions will use an alternate control part #63.24 in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING OHMS	WATT	REPLACEMENT DATA: FADA PART No	IRC PART No	NOTES
R6	15K			BTS-15K	
R7	1Meg			BTS-1Meg	
R8	750K 5%			BTS-750K 5%	
R9	220K			BTS-220K	
R10	15K				
R11	4700Ω			BTS-4700	
R12	470Ω			BTS-470	
R13	1000Ω			BTS-1000	
R14	470Ω		32.173	BTS-470	
R15	470Ω		32.173	BTS-470	
R16	470Ω		32.173	BTS-470	
R17	470Ω		32.173	BTS-470	
R18	10K		32.11	BTS-10K	
R19	470Ω		32.173	BTS-470	
R20	47Ω		32.197	BTS-47	
R21	470Ω		32.173	BTS-470	
R22	39K		32.200	BTS-39K	
R23	470Ω		32.197	BTS-470	
R24	47Ω		32.197	BTS-47	
R25	33K		32.13	BTS-33K	
R26	470Ω		32.173	BTS-470	
R27	220Ω		32.5	BTS-220	
R28	1Meg		32.33	BTS-1Meg	
R29	5600Ω 5%		32.126	BTS-5600 5%	
R30	1Meg		32.33	BTS-1Meg	
R31	8500Ω	2	32.051	BTS-8500	
R32	33K	1	32.409	BTA-33K	
R33	47Ω		32.197	BTS-47	
R34	100K		32.98	BTS-100K	
R35	470K		32.99	BTS-470K	
R36	3300Ω	1	32.265	BTA-3300	
R37	10K		32.12	BTS-10K	
R38	47K		32.15	BTS-47K	
R39	10Meg		32.99	BTS-10Meg	
R40	22K		32.18	BTS-220K	
R41	470K		32.92	BTS-470K	
R42	470	1	32.360	BTA-470	
R43	680Ω	1	32.115	BTA-680	
R44	22K		32.13	BTS-22K	
R45	470K		32.92	BTS-470K	Note 1

ITEM No	RATING OHMS	WATT	REPLACEMENT DATA: FADA PART No.	IRC PART No.	NOTES
R46	3.3Meg		32.34	BTS-3.3Meg	
R47	47K	1	32.158	BTA-47K	
R48	18K	1	32.33	BTA-18K	
R49	1Meg		32.33	BTS-1Meg	
R50	220K		32.18	BTS-220K	
R51	18K	2	32.056	BTS-18K	
R52	4700Ω		33.9	BTS-4700	
R53	10K		33.69	BTS-10K	
R54A	22K			BTS-22K	
B	8200Ω		†167.1	BTS-8200	
C	8200Ω			BTS-8200	
R55	1.5Meg			BTS-1.5Meg	Note 2
R56	2.2Meg		33.34	BTS-2.2Meg	
R57	10K		33.11	BTS-10K	
R58	2.2Meg		33.34	BTS-2.2Meg	
R59	56Ω		33.88		
R60	4700Ω	2	33.849	BTS-4700	
R61	150K		33.90	BTS-150K	
R62	330K		33.205	BTS-330K	
R64	820K		33.23	BTS-820	
R65	330K		33.206	BTS-330K	
R66	82K		33.204	BTS-82K	
R67	3900Ω		33.203	BTS-3900	
R68	68K		33.16	BTS-68K	
R69	27K		33.85	BTS-27K	
R70	100K		33.90	BTS-100K	
R71	1.8Meg		33.208	BTS-1.8Meg	
R72	18K		33.81	BTS-18K	
R73	47K		33.15	BTS-47K	
R74	47Ω		33.197	BTS-47	
R75	470K		33.92	BTS-470K	
R76	8200Ω	2		BTS-8200	Note 3
R77	100Ω	2	33.636	BTS-100	
R78	10K		33.11	BTS-10K	
R79	33Ω		33.43	BTS-33	
R80	3.3Ω		33.42	SWW-3.3	
R81	1700Ω	30	1W.98	2D-1758	
R82	33Ω			BTS-33	Note 1

† Items R54A, R54B, R54C, C56A, C56B, C56C are combined in one unit.
Note 1. Not used in some versions.
Note 2. Some versions use a 1.5Meg resistor in this application (part #32.206).
Note 3. Some versions use a 6800Ω, 2 watt resistor in this application (part #33.65).

TRANSFORMER (POWER)

ITEM No	RATING		REPLACEMENT DATA: FADA PART No	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
	PRI.	SEC. 1 SEC. 2 SEC. 3						
T1	117VAC ①1.65A ②.240A	525VCT ③ 5A	5V ④ 3A	6.3V ⑤ 9.3A	42.90	P-8830 ③⑤	P-8334 ⑦	26B33 ① ②	R-15BC ③⑤

① Tape High HV Winding. Tape 5V ④ 3A Winding.
② Parallel & Phase 6.3V ⑤ 5A Windings.
③ Tape 6.3V ⑤ 1.2A Winding.
④ Parallel & Phase 6.3V ⑤ 3A Windings.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: FADA PART No	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	42.53	B8700	A-3000	209T1	V40S ①	A-811	24A87	A-95X
T3	Horiz. Output Trans	42.96 ①	FB460 *	HVO-36*		X139* ②	A-8254*	FLY-75*	D-49* ③
		42.93 ②	FB444*	HVO-21* ③	235T1 *③	X064 *	A-8198*	FLY-72*	D-44*
T4	Vert. Output Trans.	42.92	21B54	A-3037	233T1	V31	A-8123	26S53	A-102X
T5A	Yoke-Horiz. (24MM)	37.285	DF600 ④	MDF-75 ④		V70F28 ④	DY-18A ④	Y-18 ④	Y-18-10 ④
B	Vert. (44MM)								

① Drill new mounting hole(s).
② For chassis using a 45MC IF system.
③ For chassis using a 21MC IF system (these have the letter "C" stamped on right hand side of rear apron).
④ Use original mounting bracket.
⑤ Use original horizontal yoke damping network.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL (CONNECTION)	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8	8	8	4	8	8	4	8
7	7	4	2	4	4	2	6
6	NC See Note ① 6	NC See Note ① 6	NC See Note ① 6	NC See Note ① 6	NC See Note ① 6	NC See Note ① 6	NC See Note ① 6
1	1	3	1	3	1	1	2
3	1	1	6	1	1	4	
5	3	3	7	2	2	3	
Special Notes ②	③	④⑤	⑥	⑦	⑧	⑨	⑩

① Connections for part #42.96.
② Connections for part #42.92.
③ Connect resistor R78 in series with capacitor C75 across horizontal yoke terminals #3 and #7.
Adjust values if necessary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI.	SEC	REPLACEMENT DATA: FADA PART No.	Halldorson PART No.	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T6	6.2KΩ	3-4Ω	42.57	S1004	A-2330	A-3817	24S51	S-3X	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: FADA PART No.	OUAM PART No.	RCA TYPE No.	NOTES
SP1	6"	PM	3-4Ω	107.56 ①	6A1	229S1	① Used in models DL400T, DL400TB, DL400TLO and DL400TBLO
	10"	PM	3-4Ω	107.58 ②	10A31	236S1	② Used in models DL400LO, DL400KLO and DL400KD

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: FADA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	1st Video IF	.5Ω	.3Ω	37.276	17-5001	TV-135	6334	
L2	2nd Video IF	.3Ω	.3Ω	37.277	17-5002	TV-137	6332	Includes 41.25MC Trap
L3	Fil. Choke	5Ω		37.69	19-3001	TV-139	6178	& Microhenry
L4	3rd Video IF	.3Ω	.3Ω	37.299	17-5003	TV-138	6333	Includes 47.25MC Trap
L5	4th Video IF	.3Ω	.3Ω	37.279	17-5004	TV-135	6334	
L6	Series Peaking Coil	1.8Ω		37.300				18 Microhenries
L7	Series Peaking Coil	1Ω		37.329	19-3125*		6159*	130 Microhenries; Wound on 10KΩ 1 W Resistor.
L8	Shunt Peaking Coil	17.5Ω		37.325	19-3860		6166	600 Microhenries
L9	4.5MC Trap	2Ω		37.326	20-1004	TV-161	1669	
L10	Series Peaking Coil	10.5Ω		37.290	19-3350 ■	TV-185 ■	6181 ■	245 Microhenries; Wound on 18KΩ 1 W Resistor.
L11	Shunt Peaking Coil	10.5Ω		37.327	19-3350	TV-185	6181	245 Microhenries
L12	Sound IF	7.5Ω		37.285				
L13	Ratio Det.	5.5Ω	1.9Ω CT	37.286	17-3497	TV-115	6305	Tertiary Winding - 70
L14	RF Choke	8.3Ω		37.288	19-1005		4618	10 Microhenries; IRC Part #CL-1

* Parallel with 10KΩ 1 Watt Resistor.
■ Parallel with 18KΩ 1 Watt Resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC	REPLACEMENT DATA: FADA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L15	23Ω	65Ω	37.219	20-1402†	TV-162†	6182†	205S1†	H-100†	22S-3†	Waveform winding - 44Ω

† Reverse Coil Mfg. In Can.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT (MAX.)	REPLACEMENT DATA: FADA PART No.	Halldorson PART No.	Merit PART No	Stancor PART No.	Thordarson PART No.	Triad PART No.
L16	240A	81Ω	1.58Y	43.91	C-5034 ①	C-3974	C-3328 ①	26C43	C-31X

① Drill one new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FADA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG P/T	1/4A 250V			318.250 (3AG P/T 1/4A)		GJV 1/4	

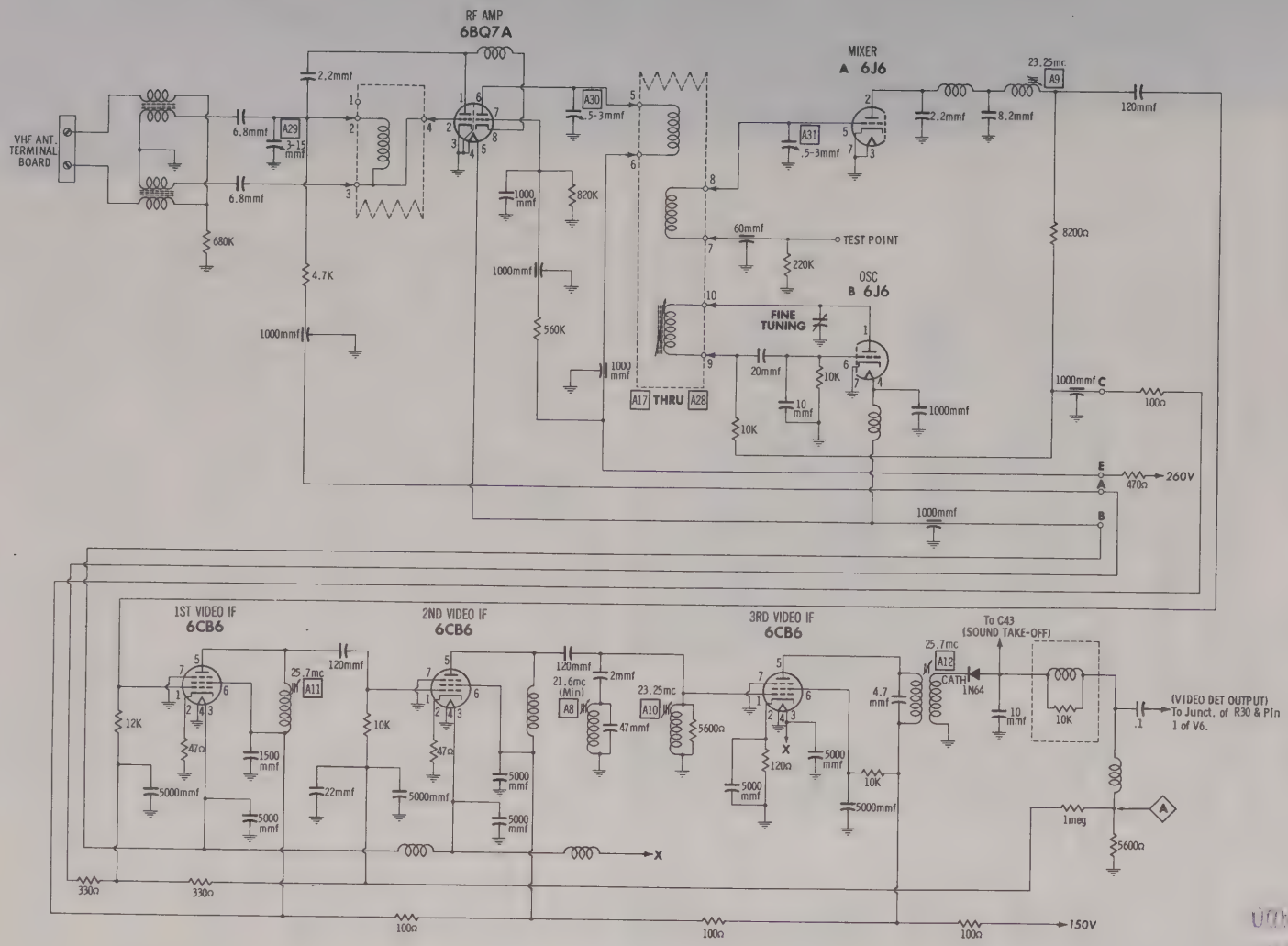
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		FADA PART No.	SYLVANIA PART No.	
M2	*	172.1	1N60	Video Det. (Pigtail)

*21MC IF Systems (Chassis With Letter "C" Imprinted On Right Hand Side Of Rear Apron Of Chassis) Use Crystal Diode Type 1N64 In This Application.

MISCELLANEOUS

ITEM No.	PART NAME	FADA PART No.	NOTES
M3	Dial Light		#47-Used in VHF-UHF models only.
M4	Tuner	42.97	VHF
	Tuner	42.75A	VHF (21MC IF system) used in chassis with letter "C" imprinted on right hand side of rear apron of chassis.
M5	Tuner	42.98	VHF-UHF combination (used in VHF-UHF models)
M6	Centering Device	112.37	Used with 21YP4, 21YP4A, 17HP4B Picture tubes
M7	Focus Magnet	112.40	Includes centering device; used with 21ZP4A or 21ZP4B Picture tubes
M8	Ion Trap	112.39	
	Trimmer Cap. } Trimmer Cap. }	132.14	{ Horiz. Lock (10-160MMF.) Horiz. Drive (40-370MMF.)
	Cabinet	97.552M	Models DL400T, DL400TB, UDL400T, UDL400TB
	Cabinet	97.552LO	Models DL 400TLO, DL400TBLO, UDL400TLO, UDL400TBLO.
	Cabinet	97.506M	Models DL400K, UDL400K
	Cabinet	97.506LO	Models DL400KLO, UDL400KLO
	Cabinet	97.562	Models DL400KD UDL400KD
	Knob	142.94-G	Vert. Hold & Picture - All models.
	Knob	142.93	Horiz. Hold & On-Off-Volume - All models.
	Knob	142.104	Channel Selector - VHF models only.
	Knob	142.98-1G	Fine Tuning - VHF models only.
	Safety Glass	92.604	Models DL400T, DL400TB, UDL400T, UDL400TB, DL400TLO, DL400TBLO, UDL400TLO, UDL400TBLO
	Safety Glass	92.566	Models DL400K, UDL400K, DL400KLO, UDL400KLO
	Safety Glass	92.630	Models DL400KD, UDL400KD
	Mask	97.553-10	Models DL400T, DL400TB, UDL400T, UDL400TB,
	Mask	97.553-11	Models DL400TLO, DL400TBLO, UDL400TLO, UDL400TBLO
	Mask	97.514-10	Models DL400K, UDL400K
	Mask	97.514-11	Models DL400KLO, UDL400KLO
	Mask	97.563-10	Models DL400KD, UDL400KD



VHF Tuner & Video IF Strip Used In Chassis With "C" Stamped On Rear of Chassis

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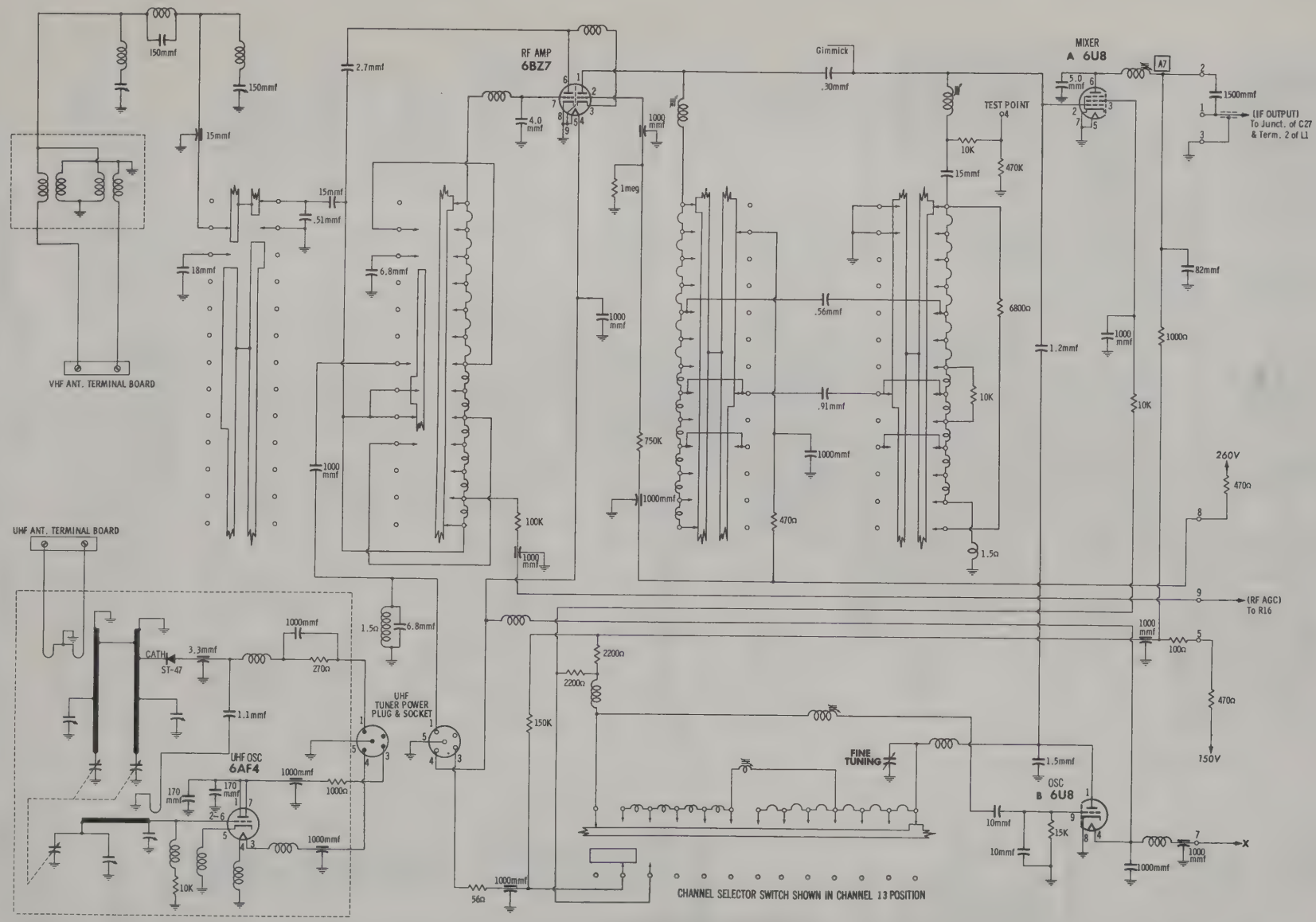
ALTERNATE VHF TUNER & VIDEO IF SCHEMATIC



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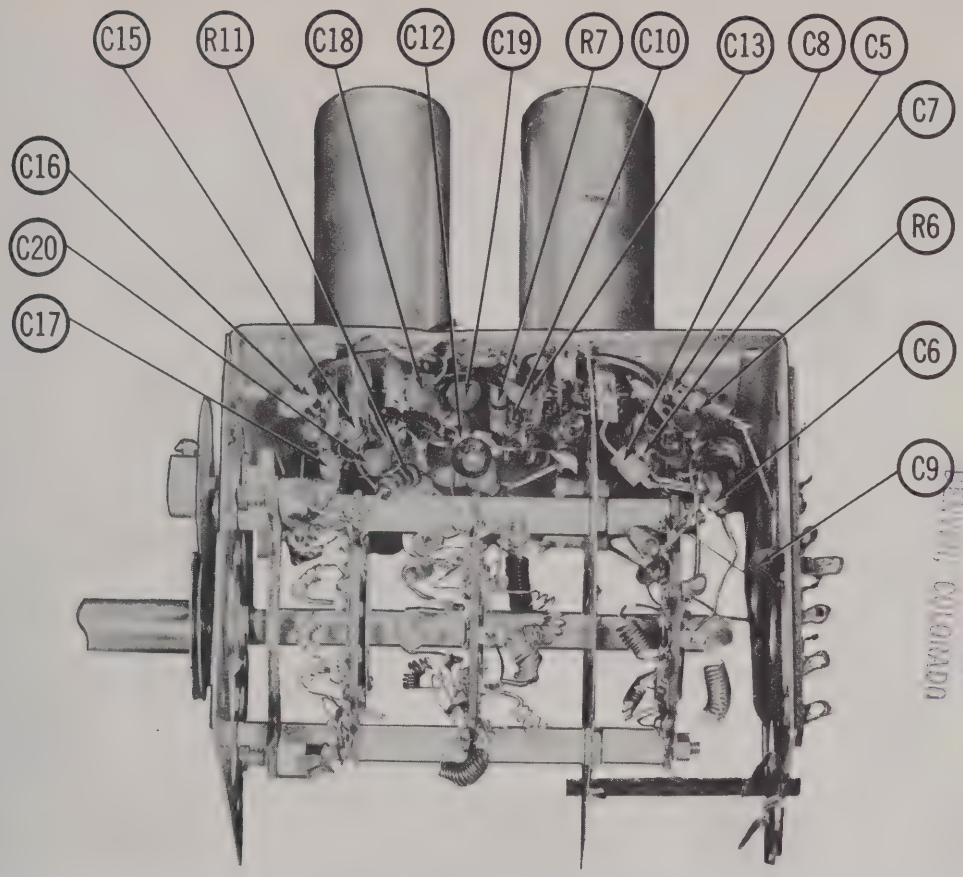
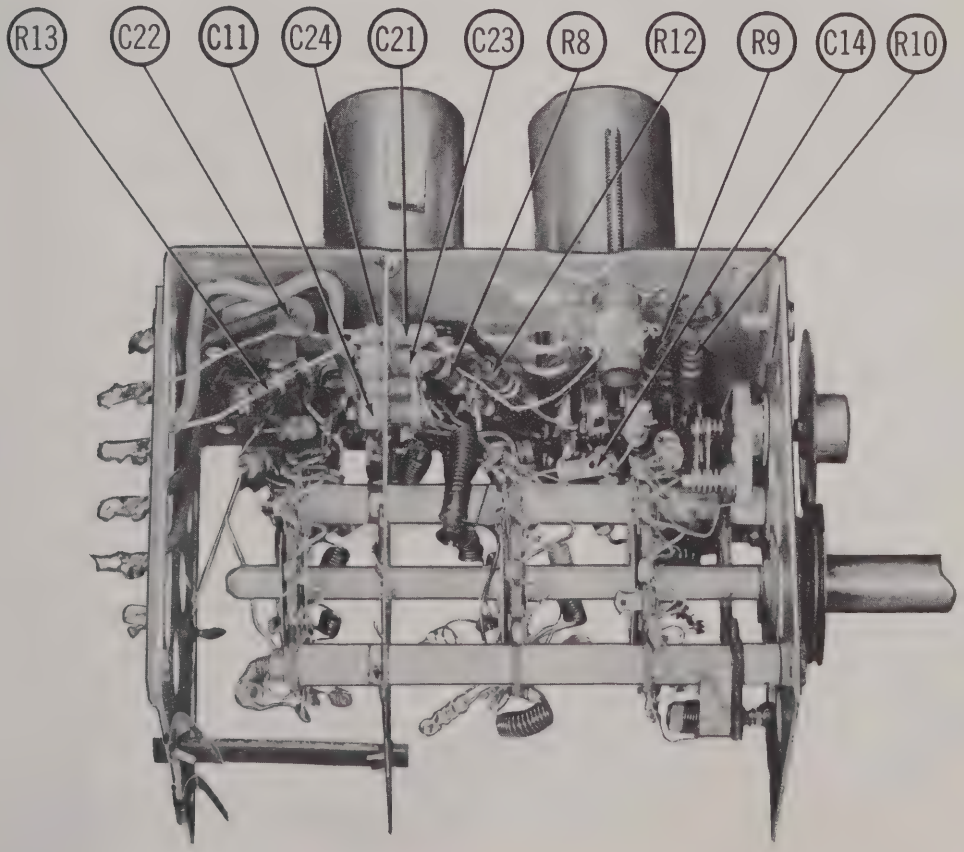
UHF-VHF Tuner Part No. 42.98 Used With UHF Models.

ALTERNATE VHF-UHF TUNER SCHEMATIC

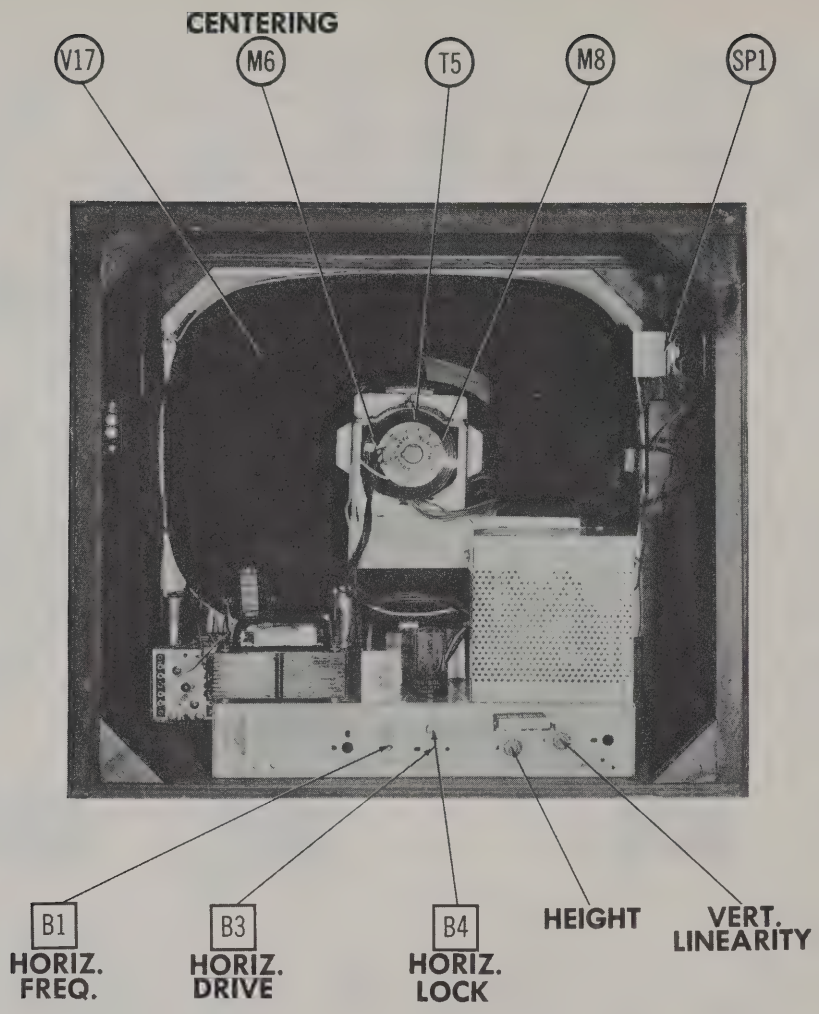


RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

L. F. DAWLENSHIP
3[illegible] KROOL ST.
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Preset horizontal lock trimmer (B4) one turn from full clockwise rotation and the horizontal drive trimmer (B3) two turns from full clockwise.

Turn the set on and tune in a TV station, preferably with a test pattern.

A. HORIZONTAL FREQUENCY ADJUSTMENT

1. Rotate the horizontal hold control over its entire range. If the picture does not remain in sync over most of its range, adjust the horizontal frequency slug (B1) for best sync.

2. If unable to adjust B1 for proper horizontal hold range, adjust the horizontal waveform slug (B2) counter clockwise a few turns and repeat step 1. Picture should remain in horizontal sync, if not, continue with "Horizontal Waveform Adjustment".

B. HORIZONTAL WAVEFORM ADJUSTMENT

1. Short together terminals "C" and "D" of the horizontal oscillator coil (L15).

2. Set the horizontal hold to its maximum counter clockwise position.

3. Adjust B1 until the picture just locks in horizontally.

4. Remove the short from L15. If the picture loses sync with the short removed, adjust B1 clockwise until the picture falls into sync.

5. Connect the vertical input lead of an oscilloscope to terminal "C" of L15. Adjust the waveform slug (B2) until the broad and narrow peaks are of equal amplitude as shown in Fig. 9. While adjusting B1, keep the picture in sync with the horizontal hold control. Disconnect the scope from the receiver.

6. Set the horizontal hold control fully clockwise and adjust B1 until the picture remains in sync while switching off channel and back again. With the horizontal hold control at mid-position the picture should remain in sync when switching off channel and back again.

C. HORIZONTAL LOCK ADJUSTMENT

1. Set the horizontal hold control fully clockwise, switch off channel and back again. Picture should remain in sync.

2. If not, SLIGHTLY adjust B1 clockwise until the picture falls out of sync with diagonal bars slanting to the left.

3. Turn the horizontal hold control counter clockwise, if more than three bars are present just before the picture falls into sync, adjust the horizontal lock trimmer (B4) clockwise. If less than two bars are present, adjust B4 counter clockwise. The picture should now remain in sync while rotating the horizontal hold control over its full range and switching off channel and back again.

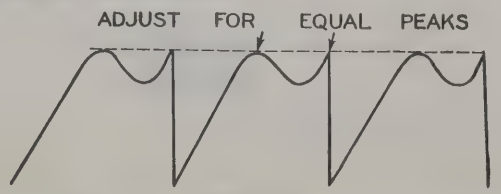


FIG. 9

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

FIRESTONE MODELS 13-G-195, 13-G-196, 13-G-197, 13-G-198, 13-G-199, 13-G-200 (Codes 334-5-A59C/A, CT/A, U/A, U/B, UT/A)

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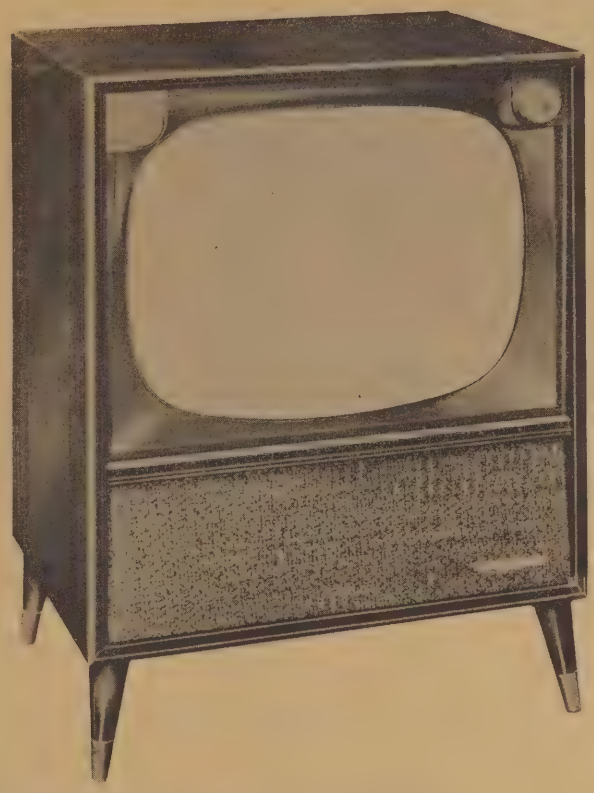

FIRESTONE MODEL 31-G-199 (Code 334-5-A59CT/A)

TRADE NAME	Firestone	MODELS	CODE
		13-G-195, 13-G-196, 13-G-199	334-5-A59C/A, 334-5-A59CT/A
		13-G-197, 13-G-198, 13-G-200	334-5-A59U/A, 334-5-A59U/B, 334-5-A59UT/A
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio		
TYPE SET	Television Receiver		
TUBES	Sixteen		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 1.38 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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FIRESTONE MODELS 13-G-195, 13-G-196, 13-G-197, 13-G-198, 13-G-199, 13-G-200 (Codes 334-5-A59C/A, CT/A, U/A, U/B, UT/A)

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PHOTOFACT* Folder
*TRADE MARK

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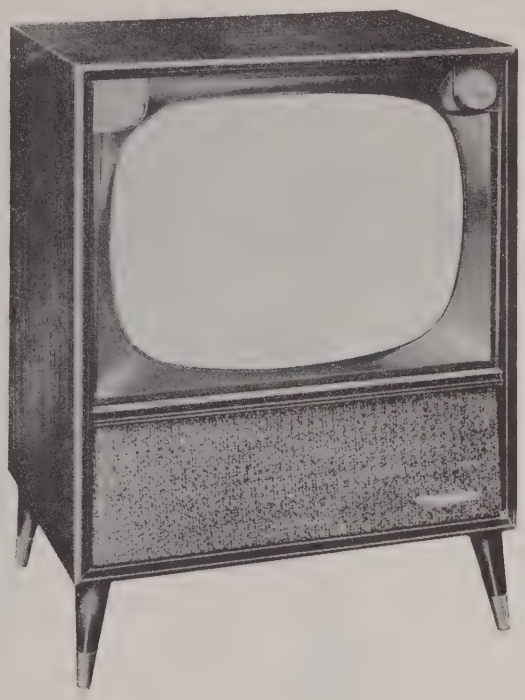

MODEL CODE

13-G-199 ..... 334-5-A59CT/A

DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL

1. Remove 4 push-on type control knobs from front panel of cabinet.
2. Remove 2 metal screws holding upper left trim plate.
3. Remove 3 small knobs.
4. Remove 5 wood screws and 1 metal screw. Remove rear cover.
5. Disconnect speaker leads.
6. Remove 2 wood screws holding rear cabinet braces at the top.
7. Remove 6 cabinet bolts. Lift cabinet up and off.
8. Remove 2 speaker nuts. Remove speaker.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs and 2 metal screws holding trim plate, adjustments are accessible, one at a time, thru the small hole in the cabinet to the right and below the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 7 push-on type control knobs from front panel of cabinet. Remove 4 metal screws holding 2 trim plates. Remove trim plates. Tilt safety glass forward and lift out. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to the set. Adjustment is located on the tube side of the chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (L23) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, it is necessary to remove the rear cover and supply power to the chassis. Adjust the buzz control (R7) for maximum volume and minimum buzz.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

FIRESTONE MODELS 13-G-195, 13-G-196, 13-G-197, 13-G-198, 13-G-199, 13-G-200 (Codes 334-5-A59C/A, CT/A, U/A, U/B, UT/A)

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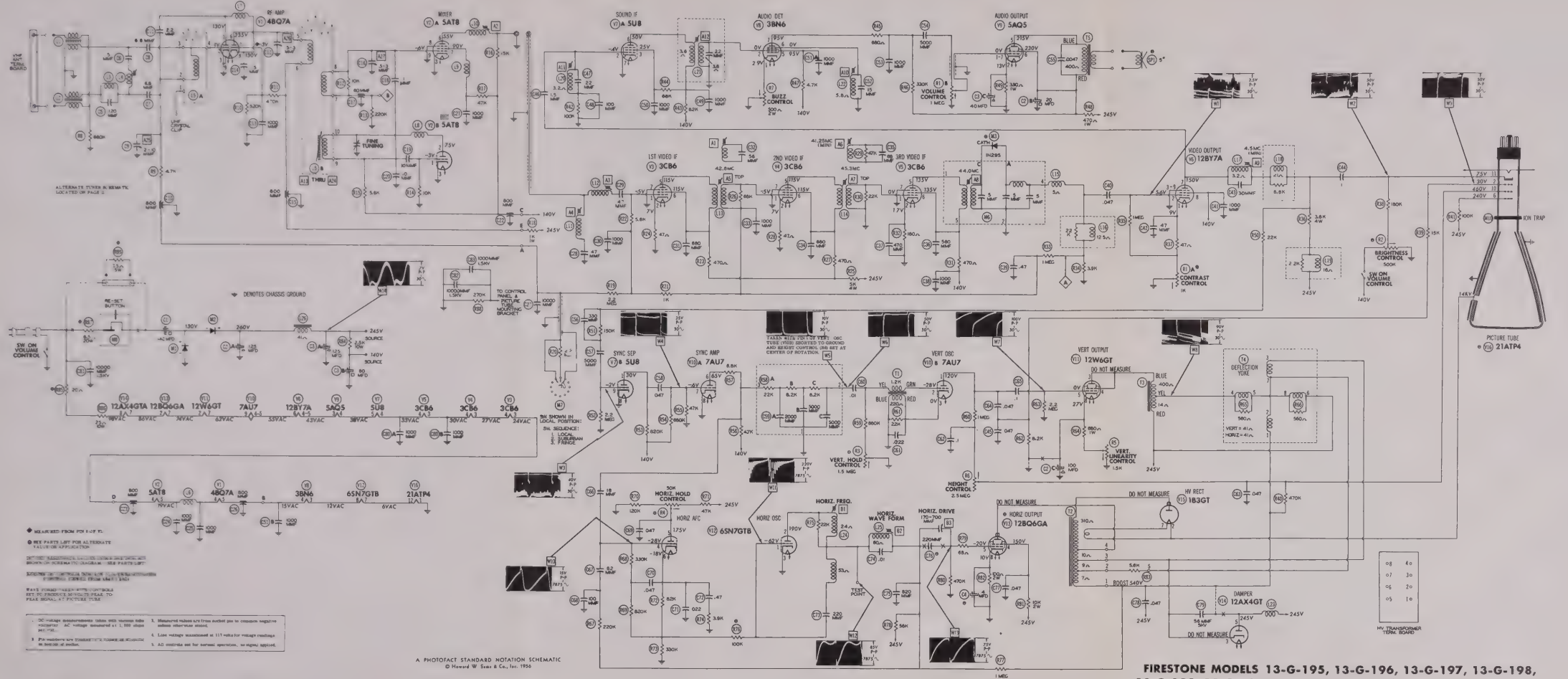

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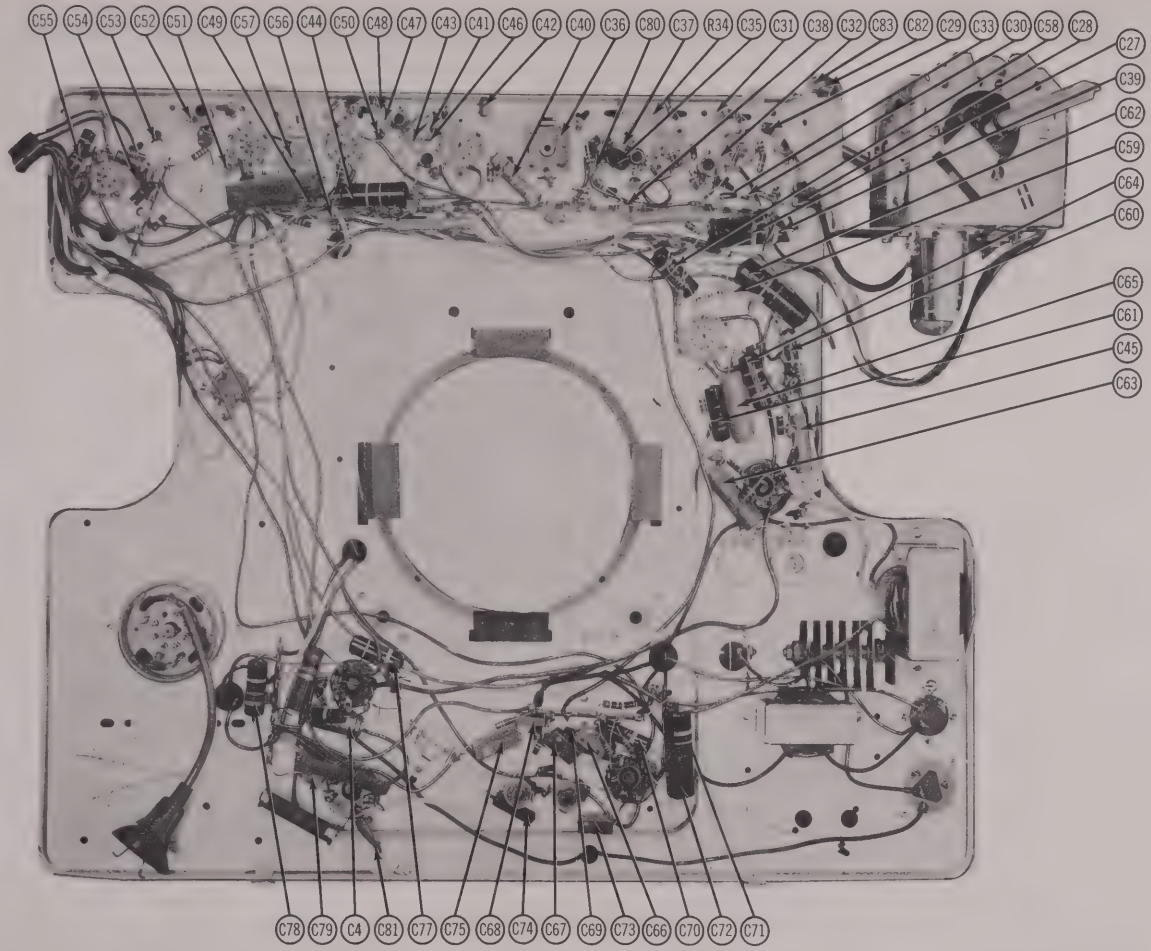
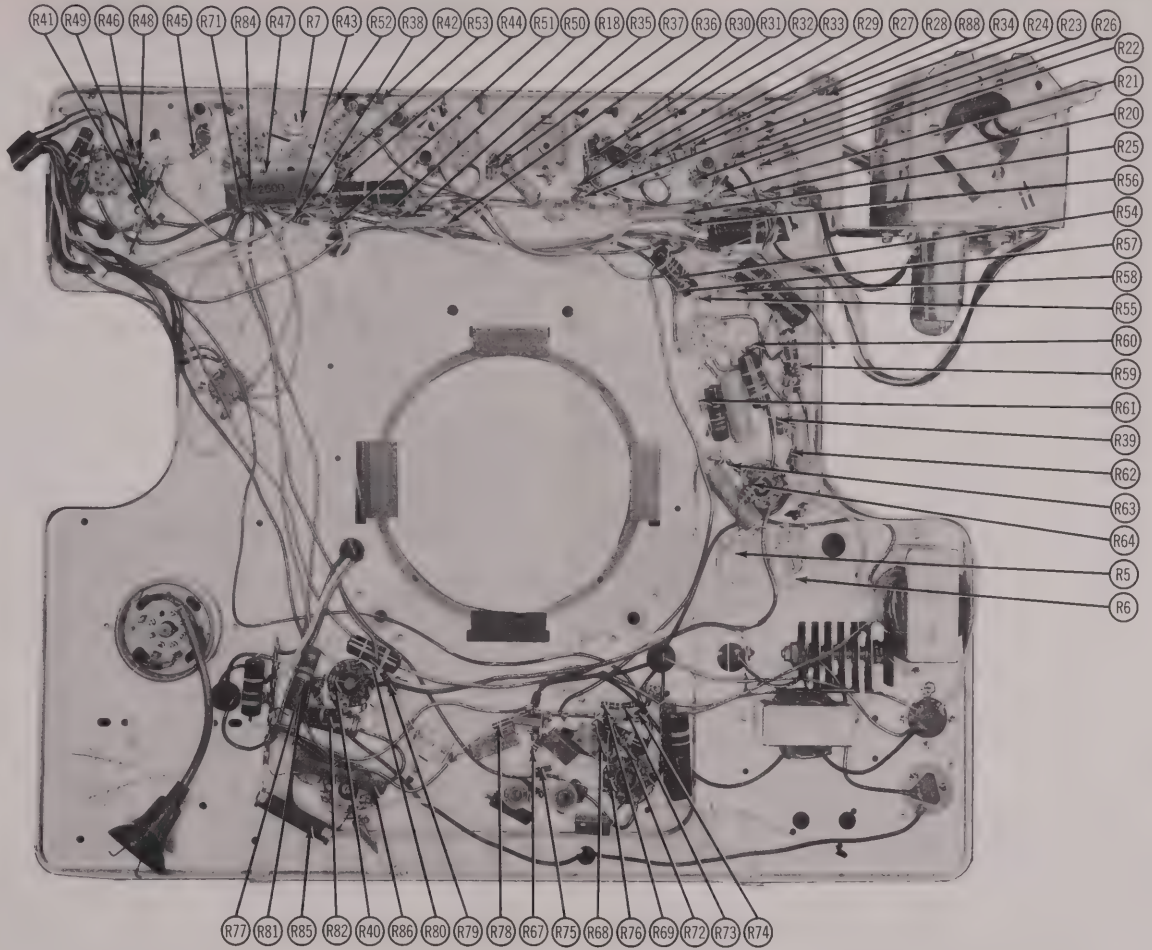
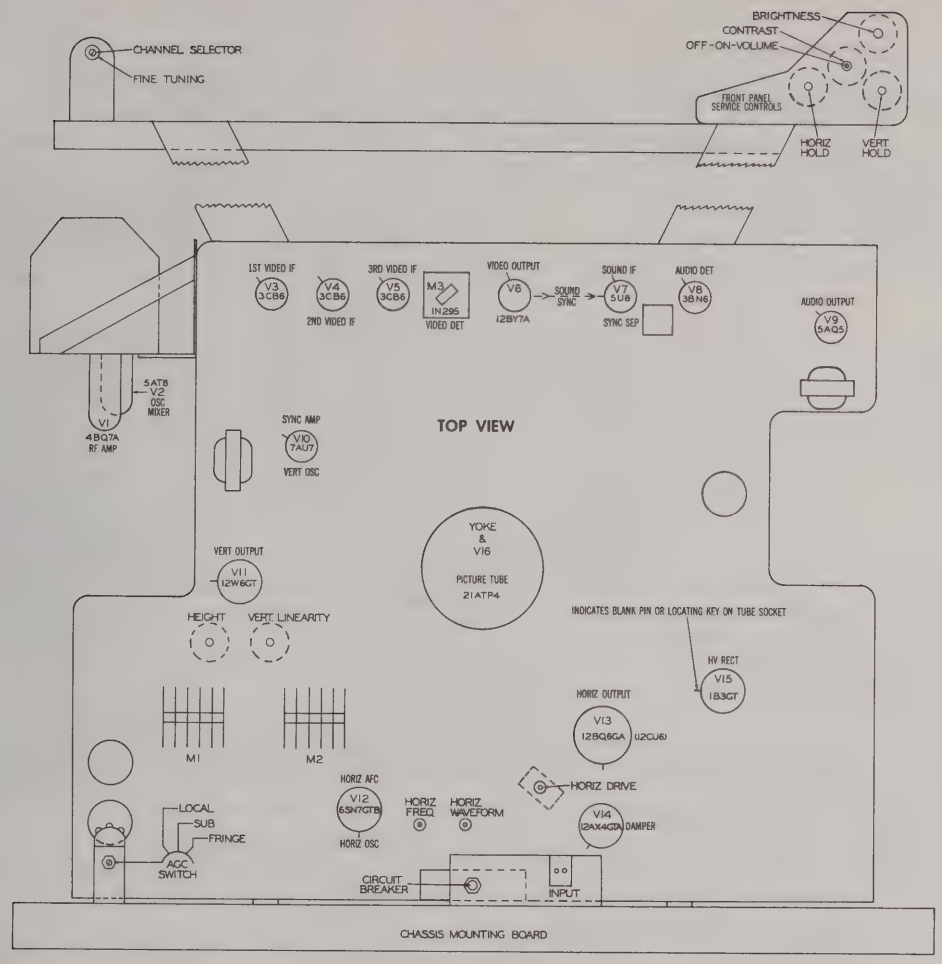


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

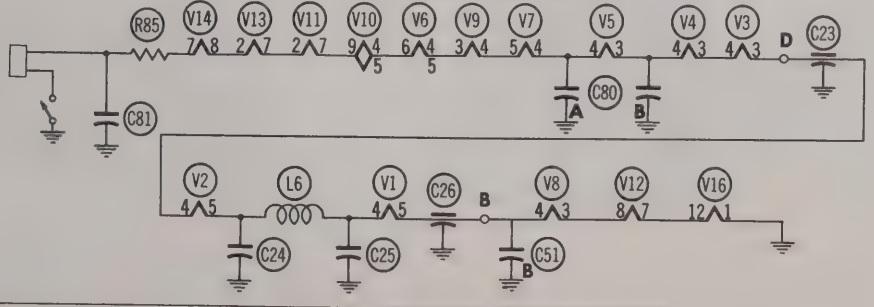
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V16**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V10**
No horiz. sync - **V10, V12**
No vert. or horiz. sync - **V7, V10**

SWEEP FAILURE
No raster, has sound - **V12, V13, V14, V15, V16**
No vertical deflection - **V10, V11**
Poor vert. linearity or foldover - **V10, V11**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, V15, M1 & M2**
Vert. off freq. - **V10**
Horiz. off freq. - **V10, V12**

NOTE: Since this receiver employs tubes used in series-parallel filament network, an open filament in any tube in series may cause the set to be inoperative. (See circuit below).



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped away from the chassis. Do not remove the horizontal oscillator (V12) to disable the high voltage.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to the ungrounded side of C33. Connect positive side to chassis.
Adjust sweep output to give adequate deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	44MC (10MC Swp)	47.25MC	Any non-interfering channel	Vert. Amp. thru detector probe (Fig. 1)., to pin 5 (plate) of 3CB6 (V3). Low side to chassis.	A1, A2, A3, A4	Adjust for response curve similar to Fig. 2. A1 positions the 47.25MC marker in trap notch. A2, A3 and A4 is adjusted for maximum amplitude with proper tilt and markers properly positioned as in Fig. 2.
2.	"	"	Not used	42.8MC	"	USE VTVM DC probe to point (A). Common to chassis.	A5	Adjust for maximum deflection.
3.	"	"	"	41.25MC	"	"	A6	Adjust for MINIMUM deflection.
4.	"	"	"	45.3MC	"	"	A7	Adjust for maximum deflection.
5.	"	"	"	44.0MC	"	"	A8	Adjust for maximum deflection.
6.	"	"	44MC (10MC Swp)	41.25MC 42.4MC 42.8MC 44.0MC 44.5MC 45.3MC 45.75MC 47.25MC	"	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.		If response is not similar to Fig.3, make SLIGHT corrective adjustments. The position of the 44.5MC marker is critical. A8 controls the symmetry of the top. A7 controls the height of the 45.75MC marker. DO NOT readjust A2 or A3. These adjustments should only be made as outlined in Step 1.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.005MFD	High side to pin 2 (grid) of 12BY7 (Video Output). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to pin 11, (cathode) of picture tube. Common to chassis.	A9	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Turn the set on and tune in a strong TV signal. Turn the buzz control (R7) 90 degrees from maximum clockwise rotation. Adjust A10 for maximum volume. Reduce the signal strength. (Remove the antenna from the antenna terminals and stray feed the signal by placing the antenna near the antenna terminals).
Adjust A11 and A12 for maximum volume. Adjust R7 for minimum noise. Reconnect antenna and readjust A10 for maximum volume. If necessary, reduce volume so this peak can be heard.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set volume control at a low volume level.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD	High side to pin 2 (grid) of 12BY7 (V6). Low side to chassis.	4.5MC (400∿Mod) (50KC Swp)	4.5MC	Any non-interfering channel	Across secondary of T5.	A10	Set buzz control (R7) 90 degrees from maximum clockwise rotation. Adjust A10 for maximum 400∿ indication on scope.
9.	"	"	"	"	"	"	A12, A11	Attenuate generator output so that signal is below limiting level of 3BN6 as evidenced by background hiss and noise. Adjust A12 and A11 for maximum 400∿ indication on scope.
10.	"	"	"	4.5MC (400∿Mod)	"	"	R7	Use a high generator output and adjust R7 for MINIMUM 400∿ indication on scope.
11.	"	"	"	4.5MC	"	"	A10	With volume control at low level, retouch A10 for maximum 400∿ indication on scope.

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to the ungrounded side. of C33. Connect the positive lead to chassis.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A14	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A15	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A23	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A24	

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT

Connect bias as under "VHF Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (B). Low side to chassis.	A25, A26, A27	Adjust for response similar to Fig. 5.
14.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel make SLIGHT compromise adjustment of A25, A26 and A27 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

UHF TUNER ALIGNMENT

The UHF portion of this receiver has been properly aligned at the factory and is very stable. Alignment of the UHF portion of this set is not recommended in the field.

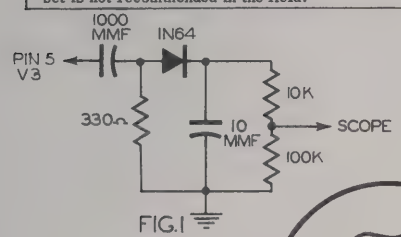


FIG.1

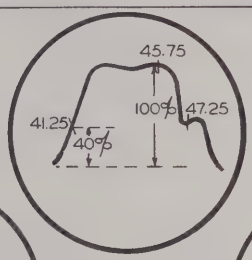


FIG.2

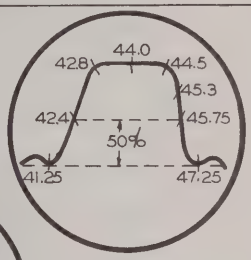


FIG.3

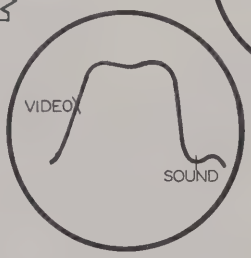


FIG.4

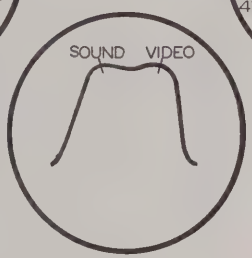
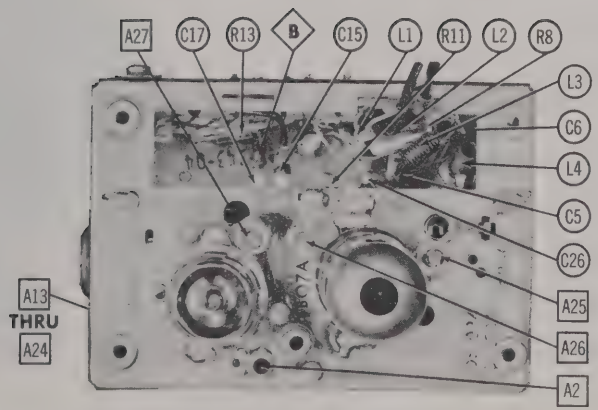
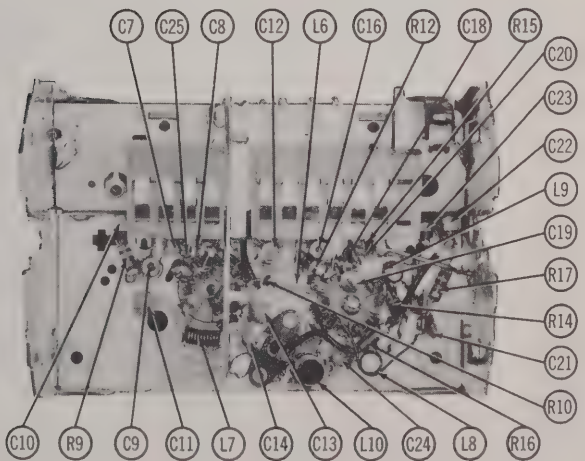


FIG.5



RF TUNER TOP VIEW



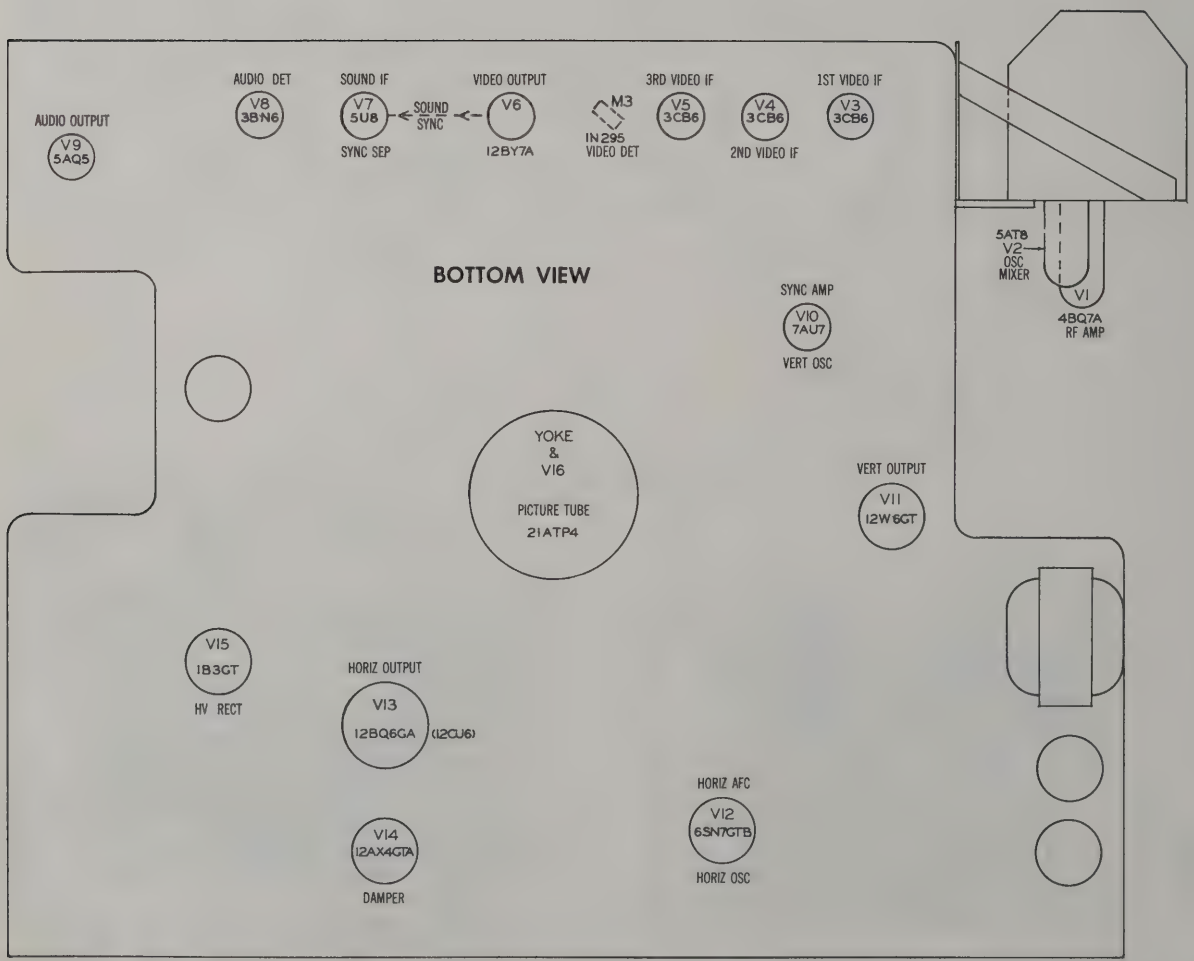
RF TUNER BOTTOM VIEW

PROPERTY OF
L. F. DEALER SERVICE
1024 MAPLE ST.
DENVER, COLORADO

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	4BQ7A	INF	3Meg	0Ω	5Ω	4Ω	† 1KΩ	300KΩ	INF	0Ω
V 2	5AT8	10KΩ	† 8.1KΩ	0Ω	6Ω	5Ω	† 18KΩ	† 50KΩ	0Ω	220KΩ
V 3	3CB6	1Meg	47Ω	6Ω	7Ω	† 5.5KΩ	† 5.5KΩ	0Ω		
V 4	3CB6	1Meg	47Ω	7Ω	8Ω	† 5.5KΩ	† 5.5KΩ	0Ω		
V 5	3CB6	.2Ω	180Ω	8Ω	9Ω	† 3KΩ	† 3KΩ	0Ω		
V 6	12BY7A	260Ω	1Meg	0Ω	11Ω	11Ω	12Ω	† 3.6KΩ	† 2.5KΩ	0Ω
V 7	5U8	† 820KΩ	100KΩ	† 150KΩ	9Ω	10Ω	† 85KΩ	0Ω	0Ω	2.2Meg
V 8	3BN6	250Ω	3.6Ω	3Ω	4Ω	† 7.2KΩ	5.8Ω	† 330KΩ		
V 9	5AQ5	50KΩ	330Ω	11Ω	10Ω	† 900Ω	† 550Ω	50KΩ		
V 10	7AU7	▲ 2.5Meg	1Meg	220Ω	12Ω	12Ω	† 14KΩ	47KΩ	0Ω	13Ω
V 11	12W6GT	TP	15Ω	† 450Ω	† 450Ω	2.2Meg	NC	13Ω	1.2KΩ	
V 12	6SN7GTB	430KΩ	† 56KΩ	0Ω	1.4Meg	† 40KΩ	400KΩ	2Ω	3Ω	
V 13	12BQ6GA	NC	17Ω	TP	† 10 KΩ	470KΩ	TP	15Ω	100Ω	TOP CAP ▲ 10Ω
V 14	12AX4GTA	TP	NC	1Meg	NC	† 41Ω	NC	17Ω	20Ω	
V 15	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 320Ω
V 16	21ATP4	0Ω	25KΩ	PIN 6 † 100KΩ	PIN 10 ▲ 470KΩ	PIN 11 † 300KΩ	PIN 12 2Ω			

† MEASURED FROM OUTPUT OF M2.
▲ MEASURED FROM PIN 3 OF V14.
TP-TIE POINT.
NC-NO CONNECTION.



TUBE PLACEMENT CHART

ALTERNATE UHF-VHF TUNER SCHEMATIC
UHF-VHF TUNER 25AI134 AND 25AI138 USED WITH UHF MODELS
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1956
UHF-VHF TUNERS 25AI134 AND 25AI138 ARE IDENTICAL EXCEPT FOR SHAFT LENGHTS.
MIXER A 5U8
OSC B 5U8
RF AMP 4BZ7
UHF OSC 2AF4
4BZ7
5U8
CRYSTAL MIXER
FINE TUNING
THRU
GIMMICK
TUNING SLUG USED ON CHANNEL 2 THRU 6 ONLY
TEST POINT
UHF TUNER POWER PLUG & SOCKET
UHF-VHF ANT. TERM. BOARD
44MC UHF IF STRIP
(IF OUTPUT) TO JUNCT. OF L11 & L12
(RF AGC) TO JUNCT OF C27, R19 & R20
(FIL. STRING) TO PIN 3 OF V3
(FIL. STRING) TO PIN 4 OF V8
245V
140V
9.2K
27K
100K
10K
6.8K
3.3K
1.5K
820K
470K
47K
22K
5.6K
1K
220K
100Ω

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA: FIRESTONE PART No.	STANDARD REPLACEMENT	NOTES
V1	RF Amplifier	6BQ7A	6BQ7A	
V2	Mixer-Osc	5A79	5A79	
V3	1st Video IF Amplifier	3C96	3C96	
V4	2nd Video IF Amplifier	3C96	3C96	
V5	3rd Video IF Amplifier	3C96	3C96	
V6	Video Output	12BY7A	12BY7A	
V7	Sound IF Amplifier-Sync Separator	5U8	5U8	
V8	Audio Detector	12BN6	12BN6	
V9	Audio Output	5AQ8	5AQ8	
V10	Sync Amplifier-Vert Oscillator	7AU7	7AU7	
V11	Vert. Output	12W6GT	12W6GT	
V12	Horiz AFC-Horiz Osc.	6SN7GTB	6SN7GTB	
V13	Horiz. Output	12BQ6GA	12BQ6GA	13CU6 may be used as an alternate
	Damper	12AX4GTA	12AX4GTA	
V14	25" Rectifier	1B3GT	1B3GT	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: FIRESTONE PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V16	21A TP4 ①	21A TP4 ①	21A TP4 ②	21A TP4 ②	① Aluminized ② Silver screen "85"
	24TP4 ①	24TP4 ①	24TP4 ②	24TP4 ②	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: FIRESTONE PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	NOTES
C1	●140	150	45X421	AFH51-70	XA-904	FPLT	TM-140-150	S-100	TVL-1428	
C1A	▲125	300	45X419		BG21	FP2X	▼TM-120B-300	FD-150	TVL-2558	
B	■20	300			BHB501	TC3501	TD-100-30	P-100	MTA-5010	○ Use A135 300
C	▲190	50								
C1A	▲135	300	45X420					Q-221.5	TVL-4634	
B	■60	300						FM-4530	TVA-1203	
C	▲40	50								
C4	4	30	(Note 1)	PRS150V4	BR530	TC30	TD-4-50	MMT-0503	TVA-1203	

Note 1. Some versions may use a 5MFD unit (part #45X415) in this application.

FIXED CAPACITORS

Capacity values given in the ranging ones in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	130		1SL8V131E	BPD-0001J	DS-131	TP95	GP3K-131	UC-5315	5GA-T13	
C6	3		1SL8C308E	MPG-265	TCS-4R7	2011	MPGA-4S0	ST-5S1	5TCCB-V47	
C7	6.8		1SL8C685E	MPG-265.6	TCZ-6R8	2012	MPGA-6R8	ST-5S68	5TCCB-V68	
C8	8.2		1SL8C825E	MPG-265.8	TCZ-8R8	2013	MPGA-8R8	ST-5S82	5TCCB-V82	
C9	5-30		31B-901		639-30					
C10	5-30		13M-320EA-.002SC							
C11	5.3		1SL8G5R3BC	MPG-E2.5	TCZ-5R3	2008	MPGA-2R5		5TCCB-V22	
C12	5-3		31B-903		639-3		S1S-01-03R3	CT968A		
C13	1000		1SL8X102E	BPD-001	DD-103	K069	801-001	DC-531	5HK-D1	
C14	1.8		1SL8C182E	MPG-E1.8	TCS-1R8	2004	MPGA-1R8	ST-5S15	5TCCB-V15	
C15	800		13M-320EA-.002SC							
C16	.5-3		31B-903		639-3		S1S-01-03R3	CT968A		
C17	300		13M-320Q-.002J							
C18	1		13D-D1-1	MPG-4Z1	TCS-1	T203	MPGA-010		5TCCB-V1	
C19	10		1SL8Q100A							
C20	10		1SL8Q100A							
C21	1000		1SL8X102E	BPD-001	DD-103	K069	801-001	DC-531	5HK-D1	
C22	130		13M-320EA-.002SC							
C23	800		13M-320EA-.002SC							
C24	1000		1SL8X102E	BPD-001	DD-103	K069	801-001	DC-531	5HK-D1	
C25	1000		1SL8X102E	BPD-001	DD-103	K069	801-001	DC-531	5HK-D1	
C26	800		13M-320EA-.002SC							
C27	10000		47X396	BPD-01	DD-103	K083	811-01	DC-531	5HK-61	
C28	47		47X808	5H47	DE-470	TP38	GP2K-470	UC-5447	5GA-Q47	
C29	47		47X808	5H47	DE-470	TP38	GP2K-470	UC-5447	5GA-Q47	
C30	1000		1SL8X102E	BPD-001	DD-103	K069	801-001	DC-531	5HK-D1	
C31	680		68X8	MPG-D0068	DD-681	K065	811-681	UC-5388	5GA-T68	
C32	56			MPG-E156	TCS-56	Z036	MPG-237-560		5TCC-Q56	
C33	1000		1SL8X102E	BPD-001	DD-103	K069	801-001	DC-531	5HK-D1	
C34	680		68X8	MPG-D0068	DD-681	K065	811-681	UC-5388	5GA-T68	
C35	680		68X8	MPG-6268	DD-681	K065	811-681		5GA-T68	
C36	560		56X8	5H560	DD-561	G063	811-561	UC-5356	5GA-T56	
C37	1000		1SL8X102E	BPD-00047	DD-103	K069	801-001	DC-531	5HK-D1	
C38	1000		1SL8X102E	BPD-001	DD-103	K069	801-001	DC-531	5HK-D1	
C39	.47	200	RCP102A474M	PSH5H-47		CUS2P47		PT6047	5TM-P47	
C40	.047	300	RCP103A473M	BPD-05	DF-503	CUS2B47		PT6047	5TM-647	Note 1
C41	1000		1SL8X102E	BPD-001	DD-103	K069	801-001	DC-531	5HK-D1	
C42	47		47X808	5H47	DE-470	TP38	GP2K-470	UC-5447	5GA-Q47	
C43	30		47X869							
C44	.1	400	RCP103A104M	P48BN-1	DF-104	CUB4P1		PT401	4TM-P1	
C45	.047	300	RCP103A473M	BPD-05	DF-503	CUS2B47		PT6047	5TM-647	
C46	1.8		47X864	MPG-E1.8	TCZ-1R8	T204	MPGA-1R8	ST-5S15	5TCCB-V15	
C47	100		10X8							
C48	100		10X8	BPD-001	DD-101	G043	801-101	UC-531	5GA-Y1	
C49	1000		1SL8X102E	BPD-001	DD-103	K069	801-001	DC-531	5HK-D1	
C50	1000		10X8	BPD-001	DD-103	K069	801-001	DC-531	5HK-D1	
C51A	1000		10X8	BPD-E2001	DDS-102	GMD68	811-001	DC-531	5HK-D21	
B	1000									
C52	15		47X872							
C53	1000		10X8	BPD-001	DD-103	K069	801-001	DC-531	5HK-D1	
C54	9000		47X307	BPD-005	DD-903	K080	811-005	DC-535	5HK-D5	
C55	.0047	600	RCP104B472M	5H4700	DE-472	CUMD47	GP3-233-472	PT6247	5TM-D47	
C56	330	600	47X879	1469-00033	DS-331	SBS733	811-331		MB-333	
C57	9000		47X307	BPD-005	DD-903	K080	811-005	DC-535	5HK-D5	
C58	.047	600	RCP104B473M	BPD-05	DF-503	CUS4B47		PT6347	4TM-847	
C58A	3000		47X87	4PA-J15	4PC-100	4J15T2M1	4A600-01	DC-535	4V-1	
B	9000							DC-535		
C	6000							DC-536		

CAPACITORS (cont)

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C60	.01	400	RCP103M103M	BPD-01	DS-103	CUB4B1	GP3-333-103	PT401	4TM-B1	
C61	.033	300	RCP103M333M	BPD-03	DD-303	CUS4B33	811-01	PT4133	4TM-833	
C62	.1	600	RCP103M104M	P48BN-1	DF-104	CUB6P1		PT601	6TM-P1	
C63	.047	600	RCP103M473M	BPD-05	DF-503	CUS6B47		PT6547	6TM-647	
C64	.047	400	RCP103M473M	BPD-05	DF-503	CUS4B47		PT4547	4TM-847	
C65	.1	600	RCP103M104M	P48BN-1	DF-104	CUB4P1		PT401	4TM-P1	
C66	18	500	RCM30B180K	1469-00018	DS-180	SBN4S18	831-180		MB-418	
C67	82	500	RCM30B820K	1469-00082	DS-820	SBN4S82	831-820		MB-482	
C68	100	500	RCM30B101K	1469-0001	DS-101	SBN5T1	801-101	MCB5S5	MB-31	
C69	.047	400	RCP103M473M	BPD-05	DF-503	CUS4B47		PT4547	4TM-847	
C70	.047	300	RCP103M473M	BPD-05	DF-503	CUS2B47		PT4547	4TM-847	
C71	.033	300	RCP103M333M	BPD-03	DD-303	CUS2B33	817-01	PT4233	4TM-833	
C73	.47	300	RCP103M474M	P28BN-47		CUS2P47		PT4647	4TM-P47	
C74	330	500	RCM30B331K	1469-00033	DA-331	SBS7T3	811-331	MCB540	MB-333	
C76	.01	600	RCP103M103M						6TM-B1	
C75	820	500	RCM39B821K	1454-00082		SBS7S3	811-821		MB-382	
C76	330	500		1469-00033	DA-331	SBS733	811-331	MCB340	MB-333	Note 5
C77	.047	400	RCP103M473M	BPD-05	DF-503			PT4547	4TM-847	
C78	.047	600	RCP103M473M	BPD-05	DF-503			PT6547	6TM-647	
C79	80	5000	47X758		DD60-500				TSGA-Q68	
C80A	1000		80X3	BPD-2X001	DDS-102	DX569	813-001	DCD-581	8HK-D21	
B	1000									
C81	10000	1500	47X615		DD1023					
C82	10000	1500	47X615		DD1023					
C83	1000	1500	81X331		HVD-15-1000	DD30-102	MCD1	UR5KV-103	DC-3021	30GA-D1

Note 1. Not used in some versions.
Note 5. Items C58A, C59B, C59C, R58A, R58B and R59C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: FIRESTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1000Ω		T833S	F1-4		† QJ-845	UF131, UR1SL	Contrast (Panel) Note 1
B	1Meg			H2-S1			UR1SL	) * Volume (Rear)
C	Switch			S3-1			UD-37	Attach to R1B.
R2A	500 KΩ		40X384	AB-5S	A47-6005-S	QJ1-133	U-50	Brightness-Note 3
B	Shaft		Not Req.	AS-6 *	RS-3S4 *	MQ	DS-27 *	Attach to R2A.
R3A	1.5Meg		40X395	AB-7S3	A47-1.5Meg-S	QJ1-139	U-155	Vertical Hold-Note 3
B	Shaft		Not Req.	AK-5 *	RS-3S4 *	MQ	DS-27 *	Attach to R3A.
R4A	500Ω		40X395	AB-5S	A47-505-S	QJ1-133	U-35	Horizontal Hold-Note 4
B	Shaft		Not Req.	AK-5 *	RS-3S4 *	MQ	DS-27 *	Attach to R4A.
R5A	5000		40X395	AB-5	A47-1000-S	QJ1-103	TAP-1131L	Vertical Linearity
B	Shaft		Not Req.	AK-10	RM-2	TQ	Not Req.	Attach to R5A.
R6	2.5Meg		40X397	BK-10	A4752.5Meg-S	QJ1-239	EU-265	Height
R7	500Ω	2	40X397	Not Req.	RM-3	TQ	Not Req.	Attach to R6A.
					39-500			Buzz (Wire Wound)

Note 1. Part No. 78X33 used in 21" UHF Models- A version, and 24" Models.
Note 2. Part No. 40X400 used in 24" Models.
Note 3. Part No. 40X402 used in 24" Models.
Note 4. Part No. 40X401 used in 24" Models.
* Shaft must be filed flat.
+ Universal Replacement (Mallory Exact Duplicate Part No. UE545).
† Concentrikit Equivalent, K-4 Kit, Base Elements & Shafts; B11-106, P6- 200 (Panel)
B11-171, B1-B18 (Rear)
76-2 Switch

RESISTORS

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: FIRESTONE PART No.	IRC PART No.	NOTES
R8	680KΩ	½	12TAE684M		
R9	470KΩ	½	12TAE473K	BTS-470K	
R10	820KΩ	½	12TAE824K	BTS-820K	
R11	470KΩ	½	12TAE474K	BTS-470K	
R12	10KΩ	½	12TAE103K		
R13	220KΩ	½	12TAE224M		
R14	10KΩ	½	12TAE103K		
R15	5600Ω	½	12TAE562M		
R16	15KΩ	½	12TAE153K		
R17	47KΩ	½	12TAE473K		
R18	1000Ω	2	C8563	BTA-1000	
R19	2.2Meg	½	B84235	BTS-2.2Meg	
R20	2.2Meg	½	B84235	BTS-2.2Meg	
R21	1000Ω	2	B83103	BTS-1000	
R22	5.6MΩ	½	B84563		
R23	470Ω	½	B84471	BTS-470	
R24	470 5%	½	B84470	BTS-47	
R25	5000Ω	2	43X332	PW4-5000	
R26	68KΩ	½	B84683		
R27	470Ω	½	B84471	BTS-470	
R28	470 5%	½	B84470	BTS-47	
R29	47KΩ	½			
R30	22KΩ	½	B84223		
R31	470Ω	½	B84471	BTS-470	
R32	180Ω	½	B84181	BTS-180	
R33	1Meg	½	B84105	BTS-1Meg	
R34	3900Ω	½	B84392	BTS-3900	
R35	1Meg	½	B84105	BTS-1Meg	
R36	3600Ω	1	B84361		
R37	47Ω	½	B84470	BTS-47	
R38	180KΩ	½	B84184	BTS-180K	
R39	15KΩ	½	B84153	BTS-15K	
R40	470KΩ	½	B84474	BTS-470K	
R41	100KΩ	½	B84104	BTS-100K	
R42	100KΩ	½	B84104	BTS-100K	
R43	82KΩ	½	B84823	BTS-82K	
R44	68KΩ	½	B84683	BTS-68K	
R45	680Ω	½	B84681	BTS-680	
R46	33KΩ	½	B84334	BTS-330K	
R47	470Ω	½	B84470	BTS-470	
R48	470Ω	1	C8547I	BTA-470	
R49	330Ω	1	C8433I	BTA-330	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: FIRESTONE PART No.	IRC PART No.	NOTES
R50	22MΩ	½	B84223	BTS-22K	
R51	150KΩ	½	B84154	BT8-150K	
R52	2.2Meg	½	B84225	BTS-2.2Meg	
R53	820KΩ	½	B84824	BTS-820K	
R54	680KΩ	½	B84684	BTS-680K	
R55	47KΩ	½	B84473	BTS-47K	
R56	4700Ω	½	B84472	BTS-4700	
R57	680Ω	½	B84681	BTS-680	
R58A	22KΩ			BTS-22K	
B	6200Ω		+ 76X7	BTS-6200	
C	8200Ω			BTS-8200	
R59	680KΩ	½	B84684	BTS-680K	
R60	1Meg	½	B84105	BTS-1Meg	
R61	22KΩ	½	B84223	BTS-22K	
R62	82KΩ	½	B84823	BTS-820K	
R63	2.2Meg	½	B84225	BTS- 2.2Meg	
R64	180Ω	½	C84681	BTA-680	
R65	560Ω	½			
R66	560Ω	½			
R67	330KΩ	½	B84224		
R68	330KΩ	½	B84334		
R69	820KΩ	½	B84824		
R70	120KΩ	½	B84124		
R71	47KΩ	½	B84473		
R72	82KΩ	½	B84823		
R73	33KΩ	½	B84334		
R74	3900Ω	½	B84392		
R75	22KΩ	½	B84223		
R76	100KΩ	½	B84104		
R77	1Meg	½	B84105		
R78	56KΩ	½	B84563		
R79	68Ω	½	B84680		
R80	470KΩ	½	B84474		
R81	10KΩ	2	D84103		
R82	10KΩ	2	D84103		
R83	5600Ω	½	B84562		
R84	2500Ω	10	43X291	1.5A-2500	
R85	30Ω		43X329		
R85	25Ω	10	43X290	1.5A-25	
R87	5.5Ω	20	43X283		
R88	270KΩ	½	B84274	BTS-270K	
R89	7.5Ω	5	43X280		

Note 1. Some versions use an 82KΩ ½W resistor in this application.
Note 2. Temperature compensating resistor.
Note 3. Used only in models with thermal type circuit breaker.
Note 4. Used only in models not using thermal type circuit breaker.
* Items R58A, R58B, R59C, C59A, C59B, C59C are combined in one unit.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: FIRESTONE PART No.	Hallorsen PART No.	Merit PART No.	RCA TYPE No.	Ram PART No	Stancor PART No.	Thordarson PART No	Triad PART No.
T1	Vert. Osc. Trans.	54X10	B6702	A-3003	30VT1	V405	A-8125	26A03	A-97X
T2	Horiz. Output Trans.	53X380	FB419 *	HVO-38 *	23ET1	X094 *	A-8263 *	FLY-16	D-50 *
T3	Vert. Output Trans.	51X173	21900	A-2823		V302	A-8142	26G72	A-104X
T4A	Yoke(90°) Horiz (53MH)	9A2373-1							
B	Vert. (11MH)	9A435							

① Drill new mounting hole(s).
Use 8 to 1 turns ratio
② Connect to auto transformer.
Includes resistors R85 and R86
Yoke rear cover and centering device.

* HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

	ORIGINAL FIRESTONE (1000[7]30M)	Hallorsen Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	4	9	9	9	9	9	9	9
	3	7 or 5	7 or 5	7 or 5	7 or 5	7 or 5	7 or 5	7 or 5
	Return	N.C. See Note ⑤	N.C. See Note ⑤	N.C. See Note ⑤	N.C. See Note ⑤	N.C. See Note ⑤	N.C. See Note ⑤	N.C. See Note ⑤
	1	1	1	1	1	4	1	1
Ignal Return	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤

⑤ Install new damping network consisting of approximately 100MMF ± 2KV, and 1000Ω ± 5W, connected in series across terms #3 and #7 of horizontal yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: FIRESTONE PART No.	Hallorsen PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No	Triad PART No.	NOTES
T6	3.5KΩ	3-4Ω	51X674	Z1061	A3818	A3949	24S81	S-50X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V C (MF)	REPLACEMENT DATA: FIRESTONE PART No.	OHMM PART No.	RCA TYPE No.	NOTES
SP1	5"	PM	3-4Ω	12AS57	SA97	20S02	① Used in some versions.
	6"	PM	3-4Ω	12AS58 ①	6A1	22M01	
	8"	PM	3-4Ω	12AS52 ①	BA2L	20S03	

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	SEC.	REPLACEMENT DATA: FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Matching Trans.	0Ω	0Ω	31T4-415				
L2	Ant. Matching Trans.	0Ω	0Ω	31T4-413				
L3	FM Trap	0Ω	0Ω	31T-417				
L4	IF Trap Coil	.3Ω		31T-418-01				
L5A	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-303-D				Channel 2
B	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-303-D				Channel 3
C	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-304-D				Channel 4
D	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-305-D				Channel 5
E	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-306-D				Channel 6
F	Ant., RF, M Mixer Grid, Osc. Coils	0Ω		31M-307-D				Channel 7
G	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-308-D				Channel 8
H	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-309-D				Channel 9
I	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-310-D				Channel 10
J	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-311-D				Channel 11
K	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-313-D				Channel 13
L6	Fil. Choke	0Ω		34A-732				
L7	Vert. Coil	0Ω		31B-727				
L8	RF Coil	0Ω		25A-154-01				
L9	RF Coil	0Ω						
L10	Conv. Plate	.1Ω		31UA-605				
L11	39MC Trap	.1Ω		BA3180		TV-183	6235	
L12	3rd Video IF	.2Ω		BA3265		TV-181	6233	
L13	2nd Video IF	.2Ω	.2Ω	BA3263			6232	Includes 47.25MC Trap
L14	3rd Video IF	.2Ω	.2Ω	BA3264			6231	Includes 41.25MC Trap, R29 and C35
L15	Series Peaking Coil	8Ω		6A3276	18-3036	TV-180	6176	39 Microhenries
L16	Shunt Peaking Coil	15.5Ω		26A13	18-4180	TV-184 *	6130 *	180 Microhenries, Wound on 22KΩ resistor
L17	4.5MC Trap	3.2Ω		BA3266	30-1094	TV-181	1469	
L18	Series Peaking Coil	5Ω		26A28	18-4400 ▲	TV-190 ▲	6123 ▲	360 Microhenries, Wound on 6.8KΩ resistor

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L19	Shunt Peaking Coil	16Ω		36A33	19-3250 ▲	TV-185 ▲	6181 ▲	225 Microhenries, Wound on 2.2KΩ resistor
L20	1st Sound IF	3.2Ω		9A2366	20-1004	TV-151	1469	
L21	2nd Sound IF	3.6Ω	3.6Ω	9A2368	17-3495	TV-113	6203	
L22	Quadrature Coil	5.8Ω		9A2367	20-1005		1480	
L23	RF Choke	.1Ω		9A2380	19-1001		4604	1.5 Microhenries

* Parallel with 22KΩ resistor.
▲ Parallel with 6.8KΩ resistor.
▲ Parallel with 2.2KΩ resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L24	77Ω		9A2372			6211 ■				Tapped @ 53Ω-Horiz. Osc.
L25	60Ω		9A2371							Horiz. Waveform

■ Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L26	.255A	41Ω	1HY	52X95-2	C5037 ①	C2996 ①	C2326 ①	26C41	C-17X ①

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	FIRESTONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.255ADC	66X14	1236A	MR300	6S300	6Q4	300	
M2	.255ADC	66X14	1236A	MR300	6S300	6Q4	300	

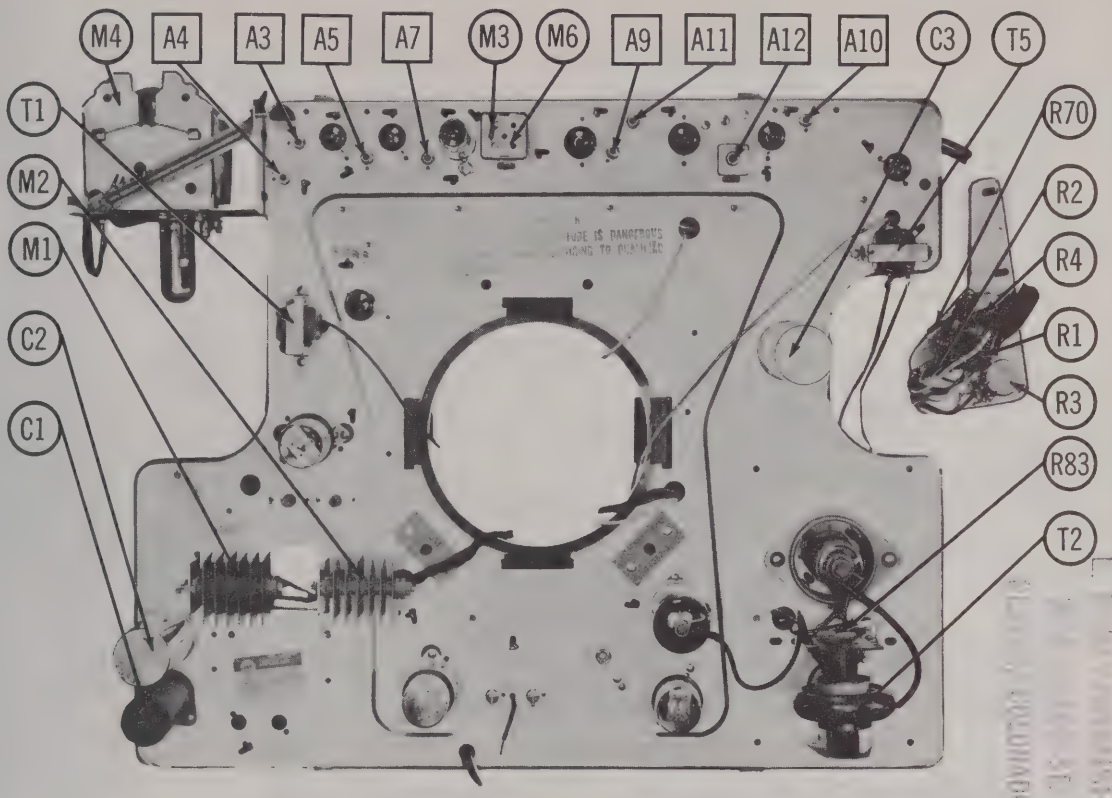
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		FIRESTONE PART No.	SYLVANIA PART No.	
M3	1N295 *		1N60	Video Det. (Pigtail)

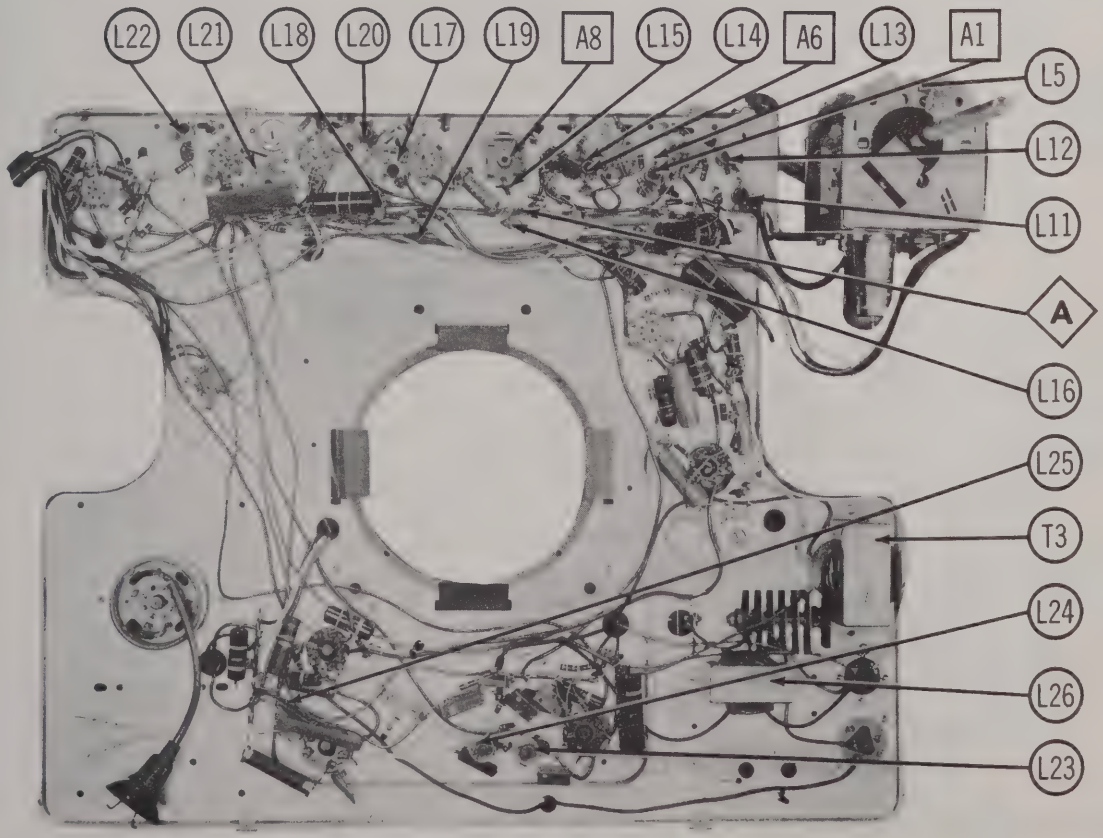
* Some versions may use crystal diode type CK706 or 1N60 in this application.

MISCELLANEOUS

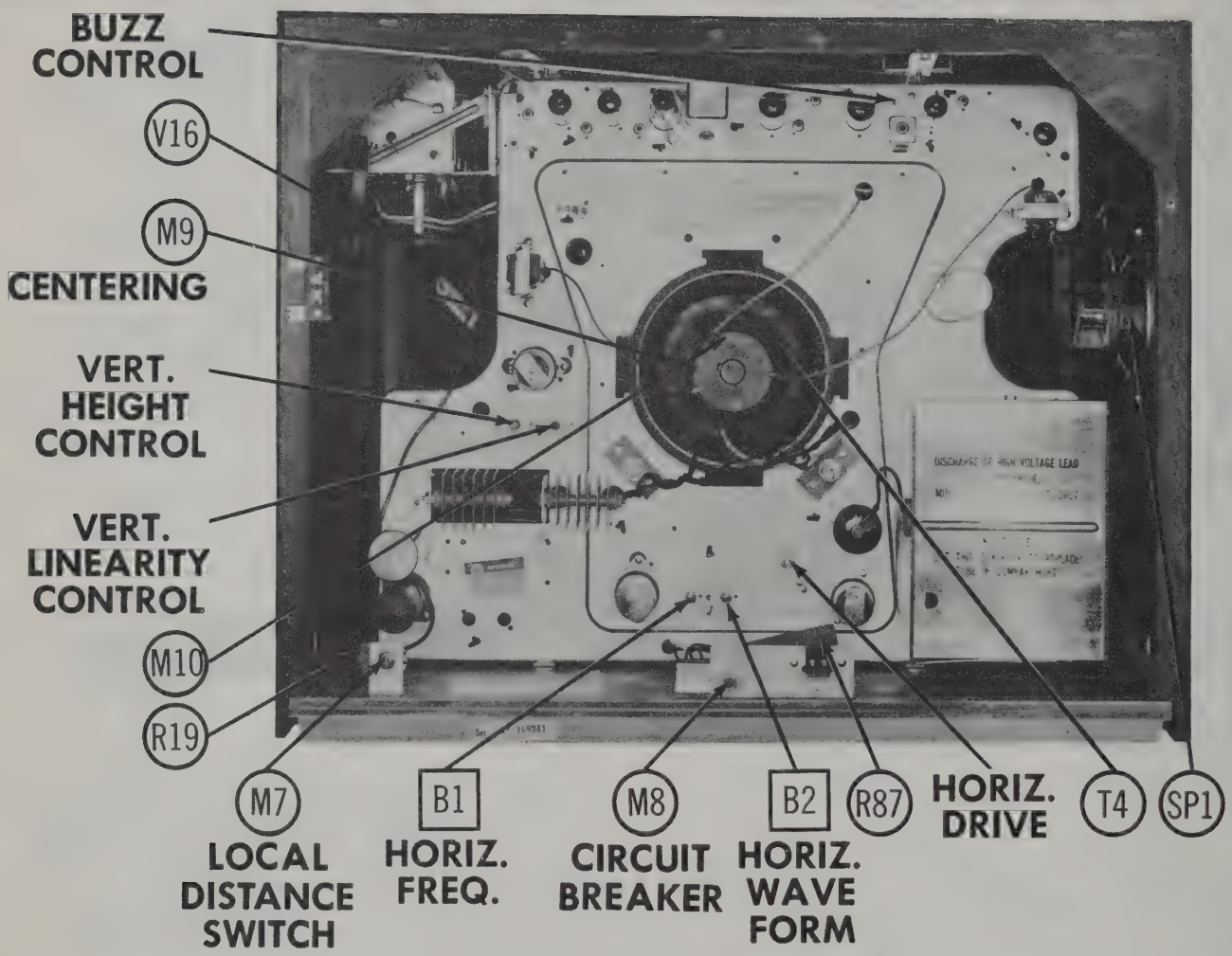
ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M4	Tuner	25A1133	VHF; VHF Models
M5	Tuner	25A1134	VHF-UHF; VHF-UHF Models
	Tuner	25A1138	VHF-UHF; VHF-UHF Code 334-5-A59U/A, 334-5-A59U/B
M6	Video Det. Assy.	9A2370	Includes M3, coils and capacitors
M7	Switch	2A459	Local-suburban-fringe (SP-3 position, rotary, wafer type)
M8	Circuit Breaker	2A461	Thermal Type-Used in later versions.
M9	Centering Device	2A435	Includes deflection yoke (T4) rear cover
M10	Ion Trap	2A421	
B3	Trimmer Cap.	17A271	Horiz. Drive (170-700MMF)



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENT.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Set the contrast control for normal contrast.

1. Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

2. Connect the vertical amplifier of an oscilloscope to the junction of L23 and L24 thru a 10MMF capacitor. Connect the low side to chassis. Adjust the horizontal waveform slug (B2) until waveform similar to Fig. 6 is obtained. While making this adjustment keep the picture in sync with the horizontal hold control.

3. Turn the horizontal hold control fully clockwise. Turn B1 clockwise until picture is just ready to pull-in sync.

4. Turn the horizontal hold control fully counter clockwise. Picture should remain in sync. Momentarily remove the signal by switching off the channel and back again. Retouch B1 if necessary.

5. While receiving a signal from a station, turn the contrast control fully counter clockwise, turn the brightness up so that the picture is washed out in appearance. Turn the horizontal drive control (B3) clockwise until white vertical bars appear in the left center of the raster, then slowly turn B3 counter clockwise until the white bars just disappear.

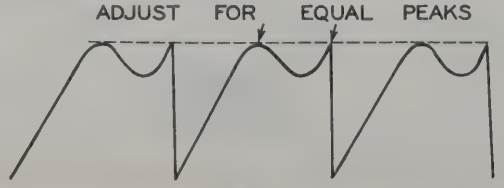
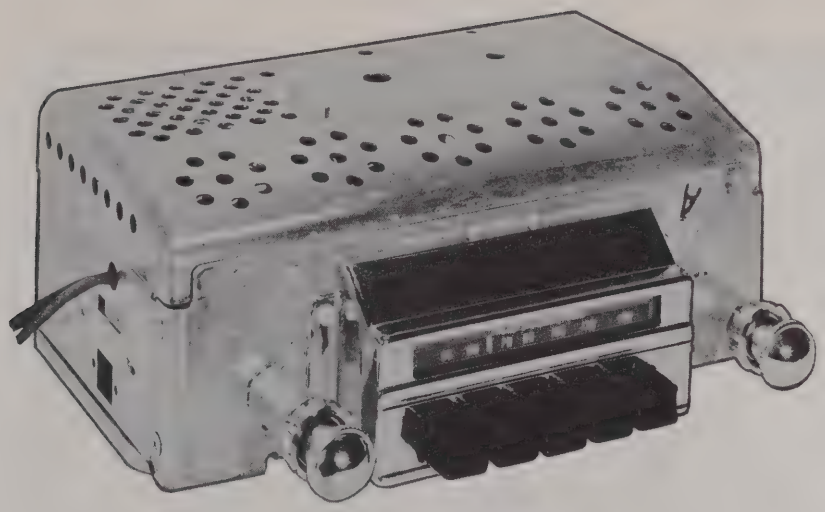


FIG. 6



PROPERTY OF
[illegible]
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MOTOROLA MODELS
1L5TCA, 1L5TCA-12

TRADE NAME	Motorola Models 1L5TCA, 1L5TCA-12 (For 1955 International R Line Trucks)
MANUFACTURER	Motorola, Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Truck Receiver
TUBES (Six)	Types 6BA6 RF Amplifier, 6BE6 Converter, 6BA6 IF Amplifier, 6CR6 Det.-AVC-AF Amp., 6AQ5 Output, 6X4 Rectifier (Equivalent 12 Volt Tubes Used in Model 1L5TCA-12)
POWER SUPPLY	6 Volts Storage Battery (Model 1L5TCA) RATING 6 Amp. @ 6.3 Volts DC 12 Volts Storage Battery (Model 1L5TCA-12) 3 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~Mod)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy to antenna receptacle.	1605KC	"	"	A5, A6, A7	"
*3.	"	"	"	"	"	"	"
*4.	"	"	1300KC	Tune to 1300KC signal	"	A8, A9, A10	"
*5.	"	"	1605KC	High frequency end stop	"	A5, A6, A7	"

6. With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum control.

* Not necessary unless tuner cores or components have been replaced. Back tuner cores out of forms before proceeding with step 3.

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton all the way out.
2. Tune manually to desired station.
3. Press pushbutton all the way in.
4. Repeat on remaining pushbuttons.

POINTER ADJUSTMENT

Tune to 1300KC signal and adjust pointer cam so that pointer coincides with 1300KC on dial.

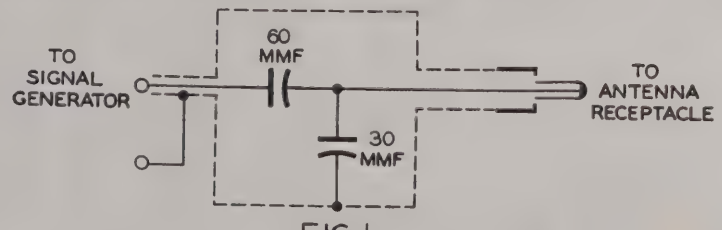


FIG. 1

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1956 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under international Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America
G506

PARTS LIST AND DESCRIPTIONS

MOTOROLA
MODEL 1L5TCA

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BA6	Note 1
V2	Converter	6BE6	Note 1
V3	IF Amplifier	6BA6	Note 1
V4	Det.-AVC-AF Amplifier	6CR6	Note 1
V5	Output	6AQ5	Note 1
V6	Rectifier	6X4	Note 1

Note 1. Equivalent 12 volt tubes used in Model 1L5TCA-12.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■15	350	23A485677	AFH3-104	C077	FP328	TMT-89	T-455	TVL-3630
B	▲10	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	90		21A591682							
C3	.005	400		SI5000	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	Note 1
C4	.05	200	8R121005	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C5	330	500	21R2744	SI330	D6-331	5W5T33	GP2K-331	UC-5333	1FM-333	
C6	.1	400	8R121006	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C7	4.7		21R115955	NP0-SI4.7	TCZ-4R7	TZ07	NP0A-4R7	ZT-5547	5TCCB-V47	
C8	47		21R115890	N750-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C9	220									
C10	.01	400	8R121002	BPD-01	DD-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C11	.002	600	8R121568	SI2000	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C12	.02	200	8R121003	BPD-02	DD-203	CUB4S2	817-02	PT412	4TM-S2	
C13	.1	400	8R121006	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C14	.02	400	8R121566	BPD-02	DD-203	CUB4S2	817-02	PT412	4TM-S2	
C15	470		21R115856	BPD-00047	DD-471	K060	831-471	UC-5347	5GA-T47	
C16	.004	600	8R121000	SI4000	D6-402	CUB6D4	GP2-333-402	PT624	6TM-D4	
C17	.02	1000	8R121004	P1088N-02		CUB16S2		PT1612	10TM-S2	Note 2
C18	.5	100	8K122076	VHC36		MP2P5		RF480	68P20	
C19	.5	100	8K122076	VHC36		MP2P5		RF480	68P20	

Note 1. Some versions use .006MFD in this application (part #8R121001).
Note 2. Model 1L5TCA-12 use .04MFD in this application (part #8A121549).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	18K535758	F1-51	RTV-588C		†UF16L	Tone (Panel)
B	250K	½		R2-38			†UR254-T753	Volume (Rear) tapped ⓐ125K
C	Switch			KB-4			†US-26	Attach to R1B

† Universal replacement (Mallory exact duplicate part #UE16S8).

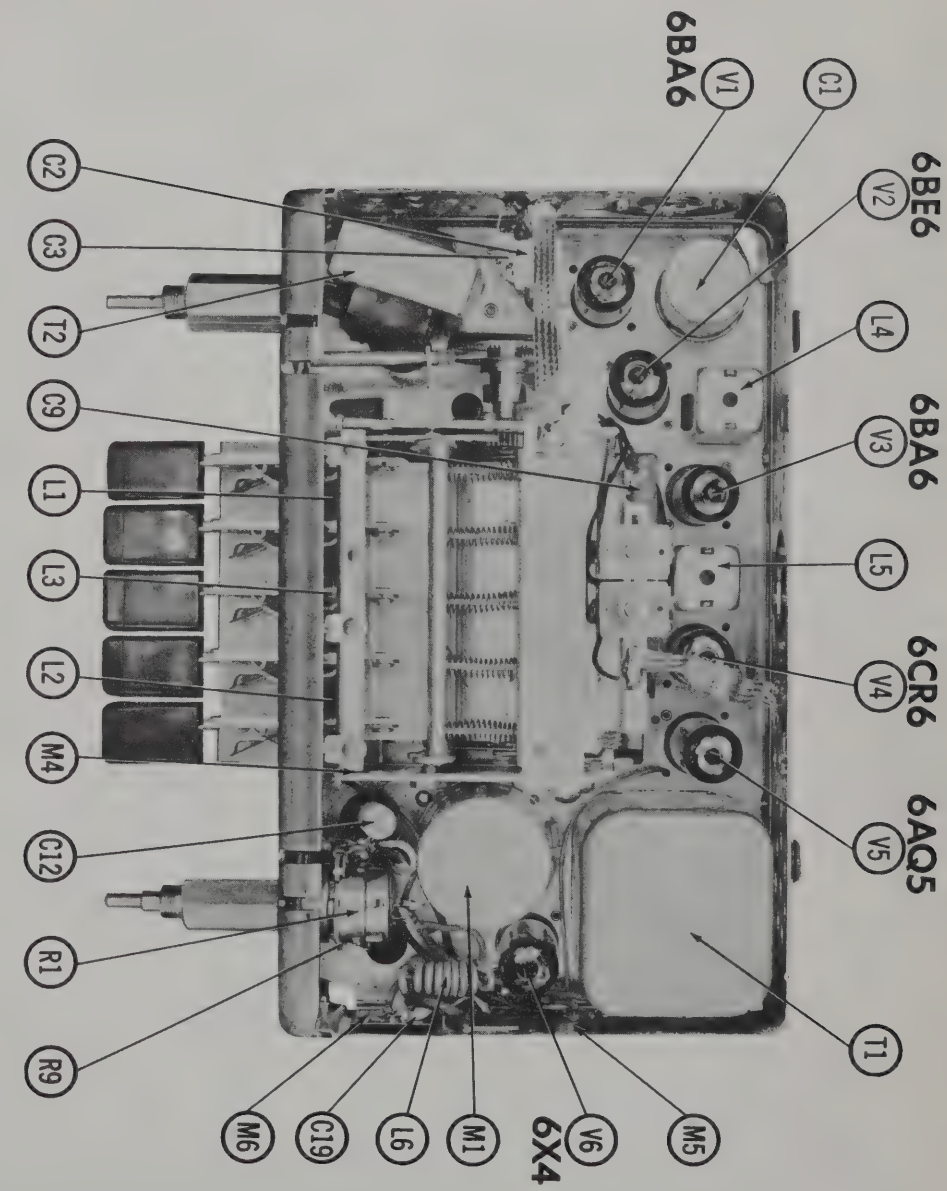
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R2	470K		6R6032	BTS-470K	
R3	15K		6R6477	BTS-15K	
R4	330Ω		6R6010	BTS-330	
R5	33K		6R6012	BTS-33K	
R6	6800Ω	2	6R5690	BTB-6800	
R7	470Ω			BTS-470	Note 1
R8	1Meg		6R6004	BTS-1Meg	
R9	15K		6R2119	BTS-15K	
R10	2.2Meg		6R3927	BTS-2.2Meg	
R11	220K		6R6015	BTS-220K	
R12	1Meg		6R6004	BTS-1Meg	
R13	220K		6R6015	BTS-220K	
R14	270Ω	1	6R6336	BTA-270	
R15	2200Ω	2	6R476130	BTB-2200	
R16	56Ω		6R5614	BTS-56	Note 2
R17	56Ω		6R5614	BTS-56	Note 2
R18	22Ω	2	6R2009		Note 3

Note 1. Some 6 volt versions use 150Ω (part #6R3992) in this application.
12 Volt versions use 330Ω (part #6R6010) in this application.
Note 2. 12 Volt versions use 220Ω, 1 watt (part #6R6389) in this application.
Note 3. Used in 12 volt models only.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	6VCT @2.9A	355VCT @.042A			25B472533-J ①			P-6471	22R67	
T1	12VCT @1.6A	560VCT @.052A			25C530737-A ②					

① Used with 6V model 1L5TCA.
② Used with 12V model 1L5TCA-12.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5.7KΩ	3-4Ω	25B500727-F	Z1107	A-2930	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	RCA TYPE No.	
SP1	5"x7"	PM	3-4Ω	50C532450	57A21	233S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	12Ω						Part of M4
L2	RF Coil	12Ω						Part of M4
L3	Osc. Coil	.9Ω	4.2Ω					Part of M4
L4	Input IF	18Ω	18Ω	24C485553	16-6758	BC-352	12-C1	
L5	Output IF	19Ω	19Ω	24K485555	16-6770	BC-355	12-C6	
L6	Fil. Choke	0Ω		24K592269				
L7	Vib. Hash Choke	.1Ω		24A472535 *				

* Alternate part #24A521816 used on model 1L5TCA-12.

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FRE-QUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6V	115∿	3333 ①	5342	903M	5342	
M1	Interrupter	12V	115∿	48B522000 ②	6301	G859	6301	

① Used with 6 volt model 1L5TCA.
② Used with 12 volt model 1L5TCA-12.

FUSES

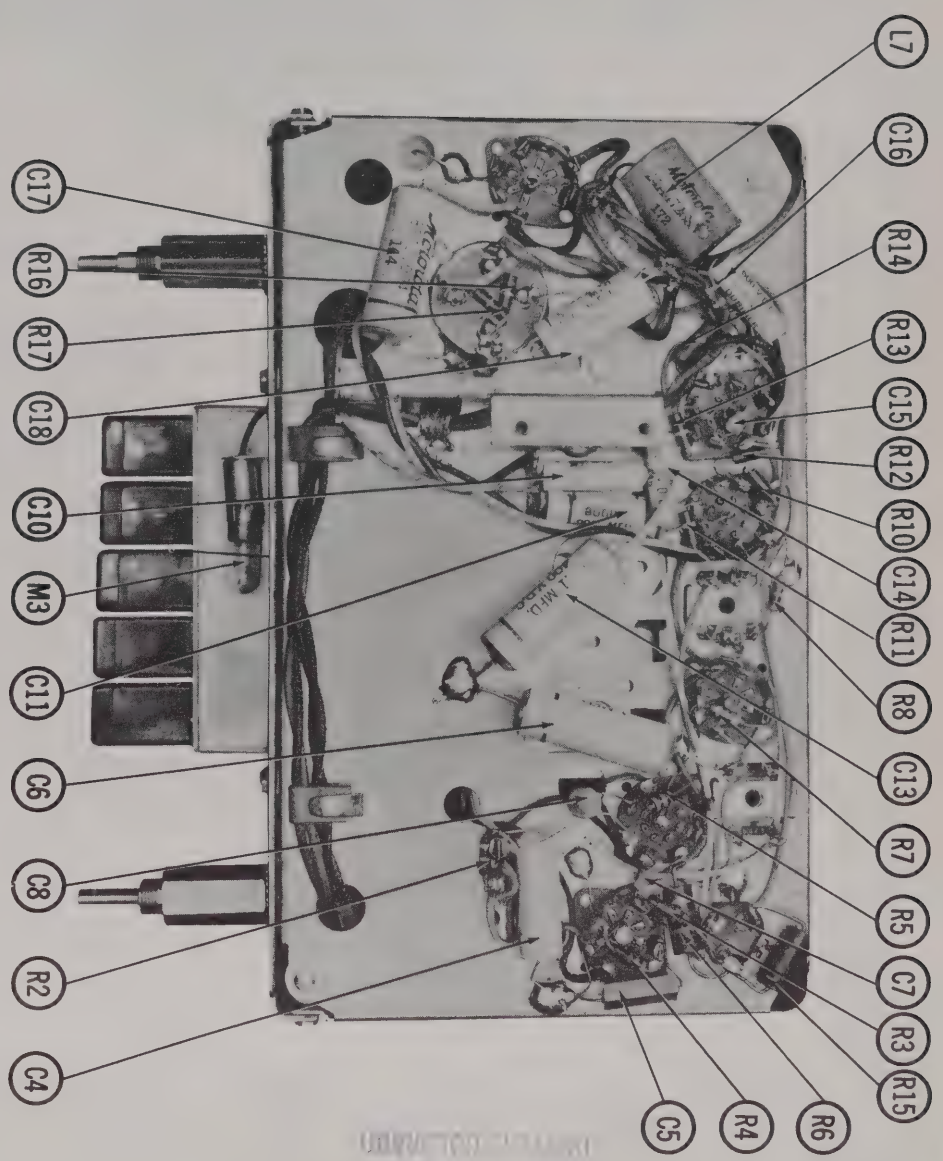
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	65R12894	9K513490	307014. (SFE 14A)	155014	SFE14	HR1
M2*	SFE	9A	65R16248	9K530763	307009. (SFE 9A)	155009	SFE9	HRH

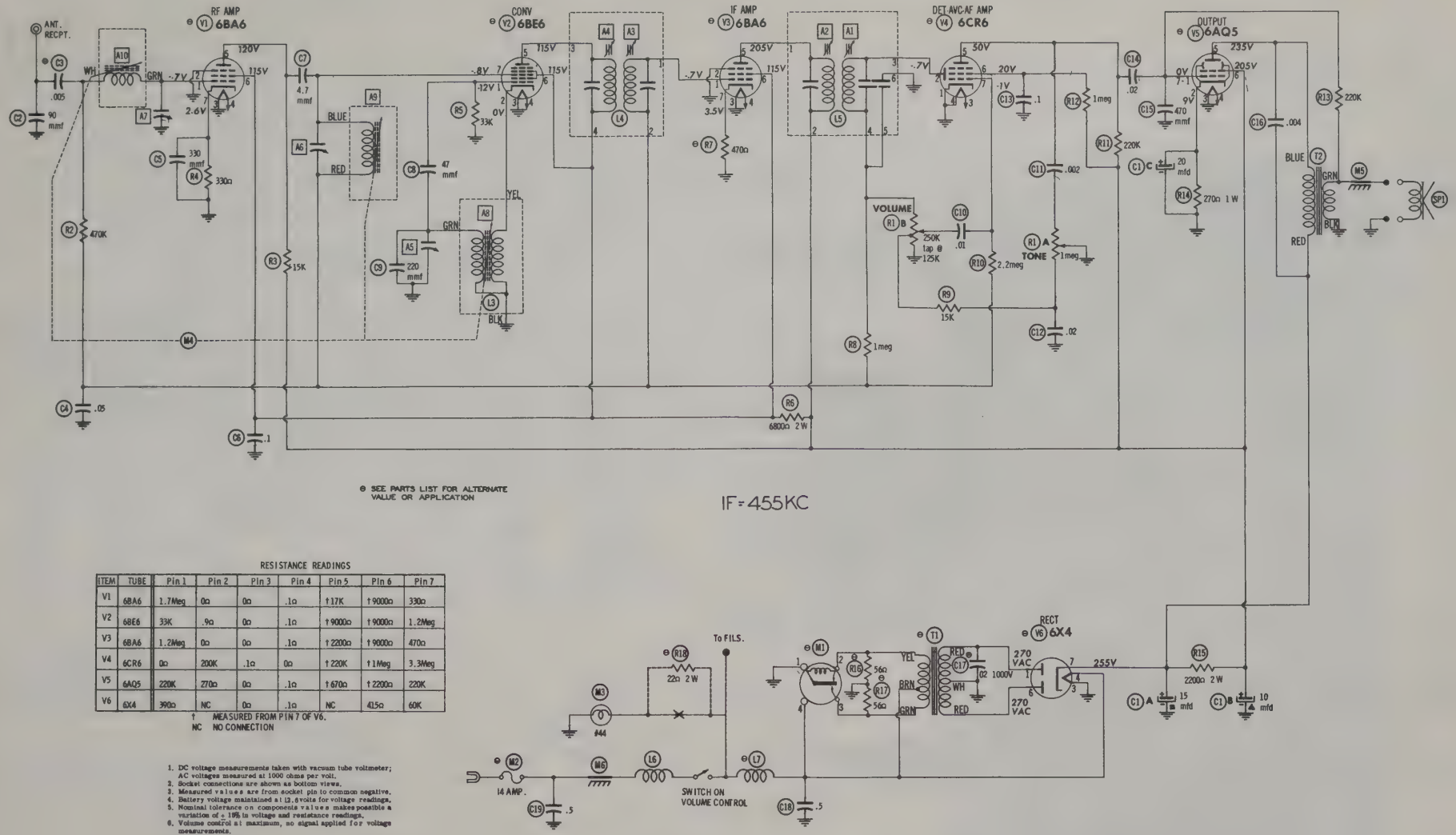
* Used in model 1L5TCA-12.

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Light	65X10867	#44
M4	Tuner	51D502000	Permeability (AT-90) Includes L1, L2, L3
M5	Spark Plate	64K531672	Speaker
M6	Spark Plate	64K531672	Power Input
A5	Trimmer Cap.	20A77537	Osc. (5-88MMF)
A6	Trimmer Cap.	20A481526	RF (20-180MMF)
A7	Trimmer Cap.	20A501419	Ant. (50-280MMF)

CHASSIS—BOTTOM VIEW





⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6BA6	1.7Meg	0Ω	0Ω	.1Ω	↑17K	↑9000Ω	330Ω
V2	6BE6	33K	.9Ω	0Ω	.1Ω	↑9000Ω	↑9000Ω	1.2Meg
V3	6BA6	1.2Meg	0Ω	0Ω	.1Ω	↑2200Ω	↑9000Ω	470Ω
V4	6CR6	0Ω	200K	.1Ω	0Ω	↑220K	↑1Meg	3.3Meg
V5	6AQ5	220K	270Ω	0Ω	.1Ω	↑670Ω	↑2200Ω	220K
V6	6X4	390Ω	NC	0Ω	.1Ω	NC	415Ω	60K

↑ MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 13.6 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PHOTOFACT* Folder

*TRADE MARK

PACKARD-BELL MODELS 17VT1, -U, 21VT1, -U (Ch. V8-1)

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Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

PACKARD-BELL MODEL 21VT1

TRADE NAME	Packard-Bell Models 17VT1, 17VT1-U, 21VT1, 21VT1-U (Ch. V8-1)
MANUFACTURER	Packard-Bell Co.-Service Div., 11th. & Hope Sts., Lost Angeles, 15, Calif.
TYPE SET	Television Receiver
TUBES	Seventeen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.34 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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PACKARD-BELL MODELS 17VT1, -U, 21VT1, -U (Ch. V8-1)

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Orange 2

~~Grey~~ ~~Brown~~ 1

White ~~Grey~~

Blue 4

3

Black

Red 1

DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL

1. Remove 6 push-on type control knobs from side panel of cabinet.

2. Remove 6 wood screws and 1 metal screw. Remove rear cover.

3. Disconnect speaker plug.

4. Remove 2 wood screws holding antenna terminal bracket.

5. Remove 4 hex bolts holding cabinet to chassis mounting board. (CAUTION: Do not remove 2 screws with large washers which are located several inches in from the sides).

6. Lift cabinet from chassis mounting board.

7. Remove 2 speaker nuts. Remove speaker.

MODELS	CHASSIS
17VT1, 17VT1-U, 21VT1, 21VT1-U	V8-1

PACKARD-BELL MODELS
17VT1, -U, 21VT1, -U (Ch. V8-1)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet to the right of the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 wood screws holding metal strip at the top edge of the safety glass. Remove metal strip and safety glass. Use extreme catuion when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

SPECIAL ADJUSTMENTS

Picture Lock Adjustment

The picture lock control should be adjusted at the location where the receiver is to be used.
Tune in a local TV station.
Turn picture lock control clockwise until sync is stable.

NOTE: If noise tends to distort sync, control should be set as far clockwise as possible without pulling picture.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjust the horizontal hold until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L9) located on top of the chassis.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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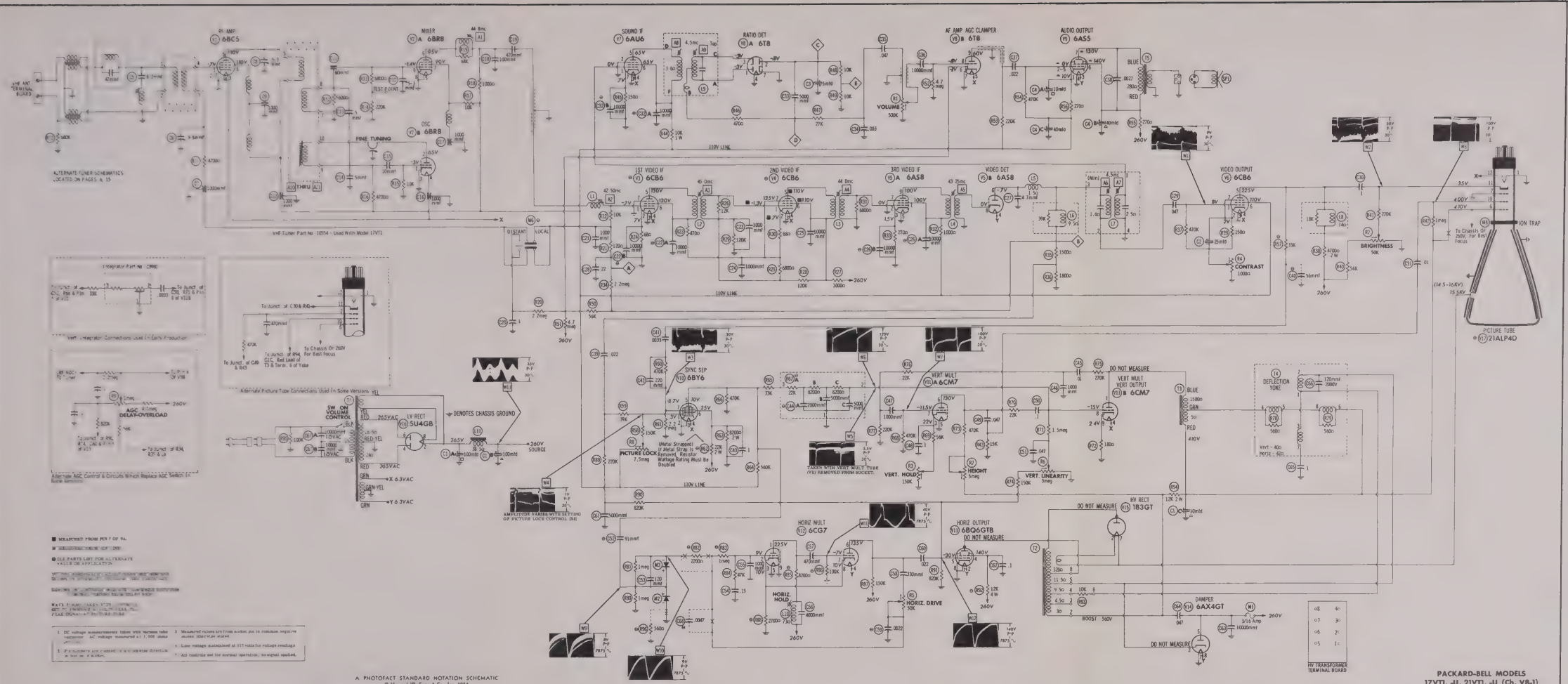
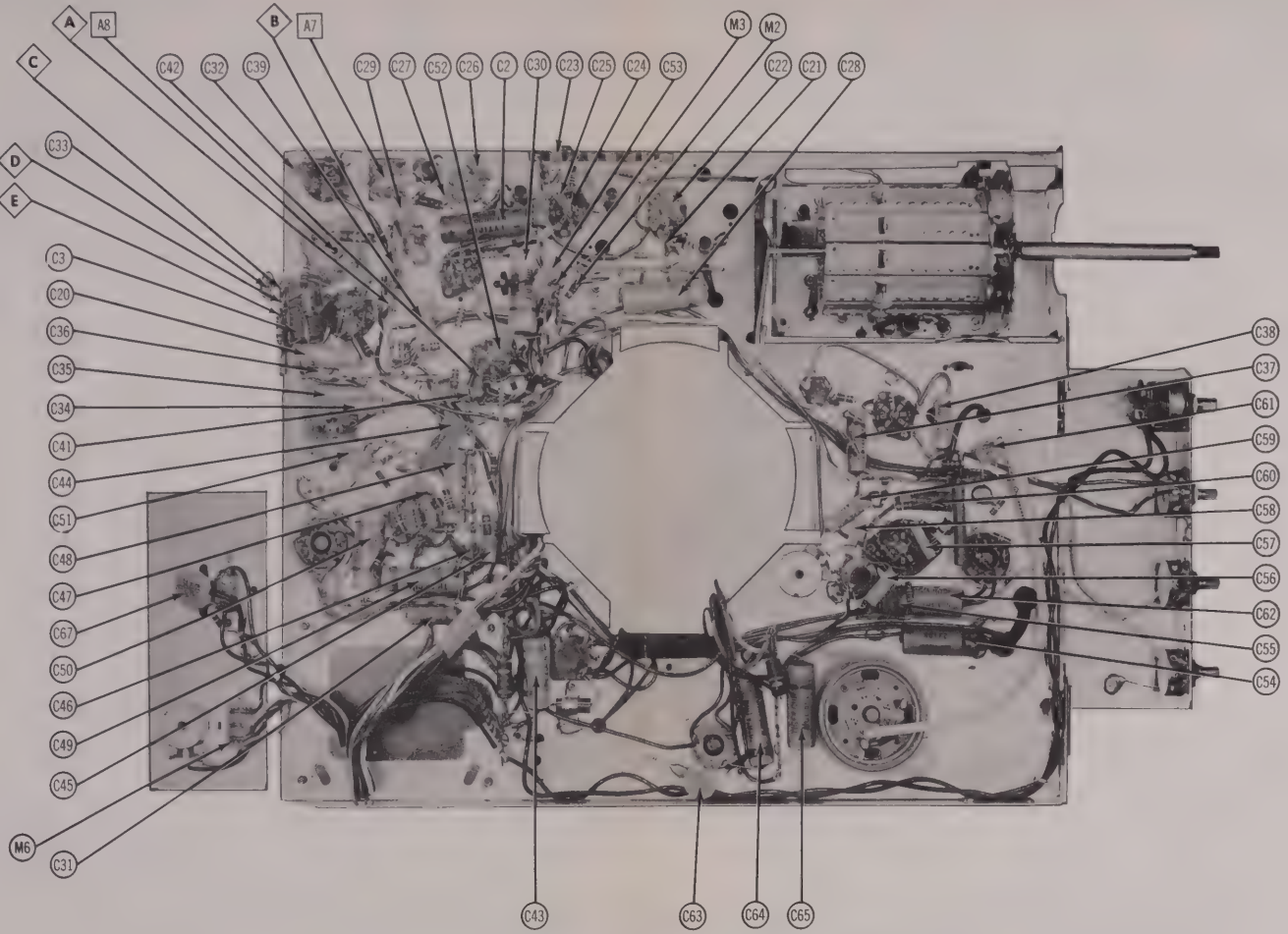
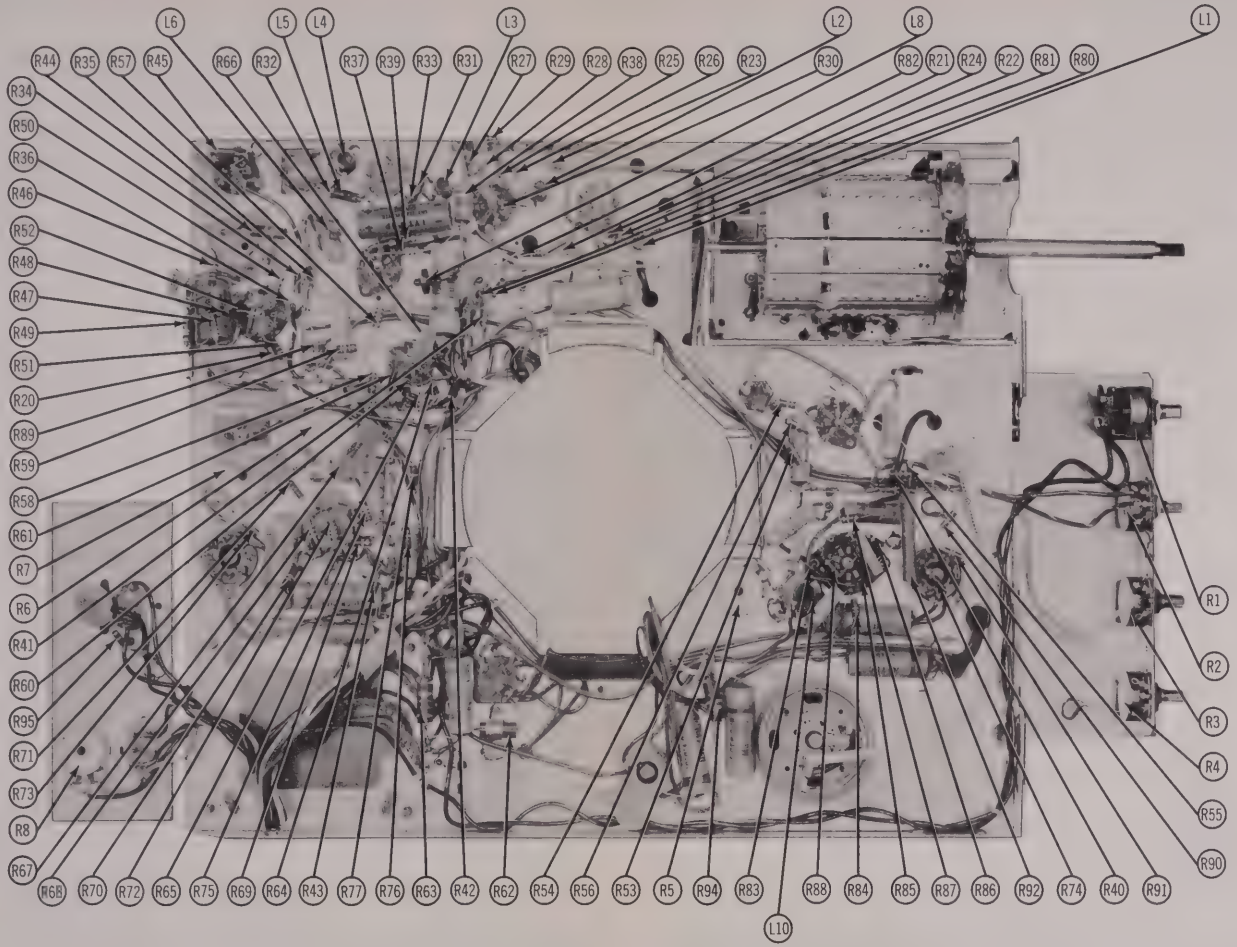


PACKARD-BELL MODELS
17VT1, -U, 21VT1, -U (Ch. V8-1)

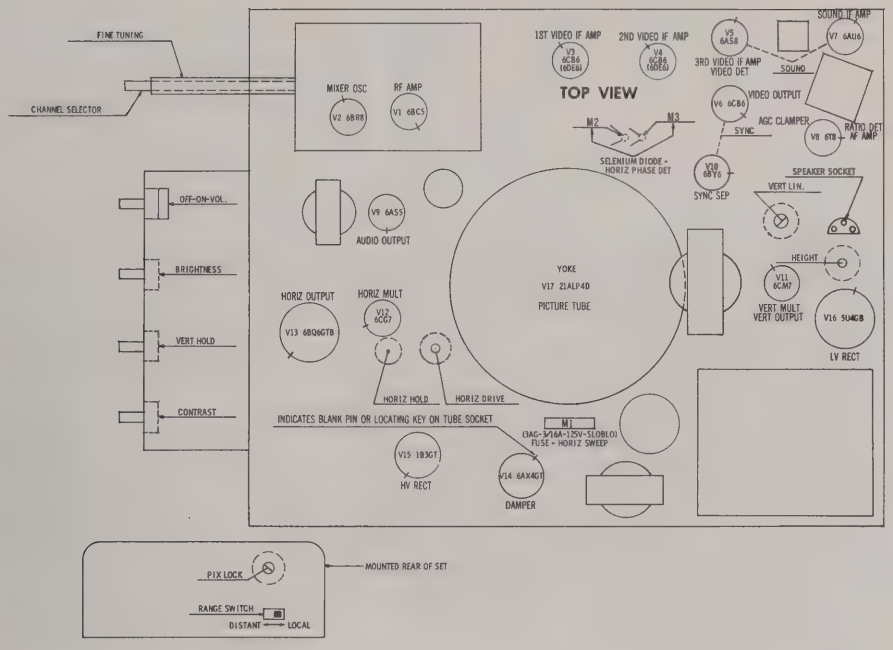


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

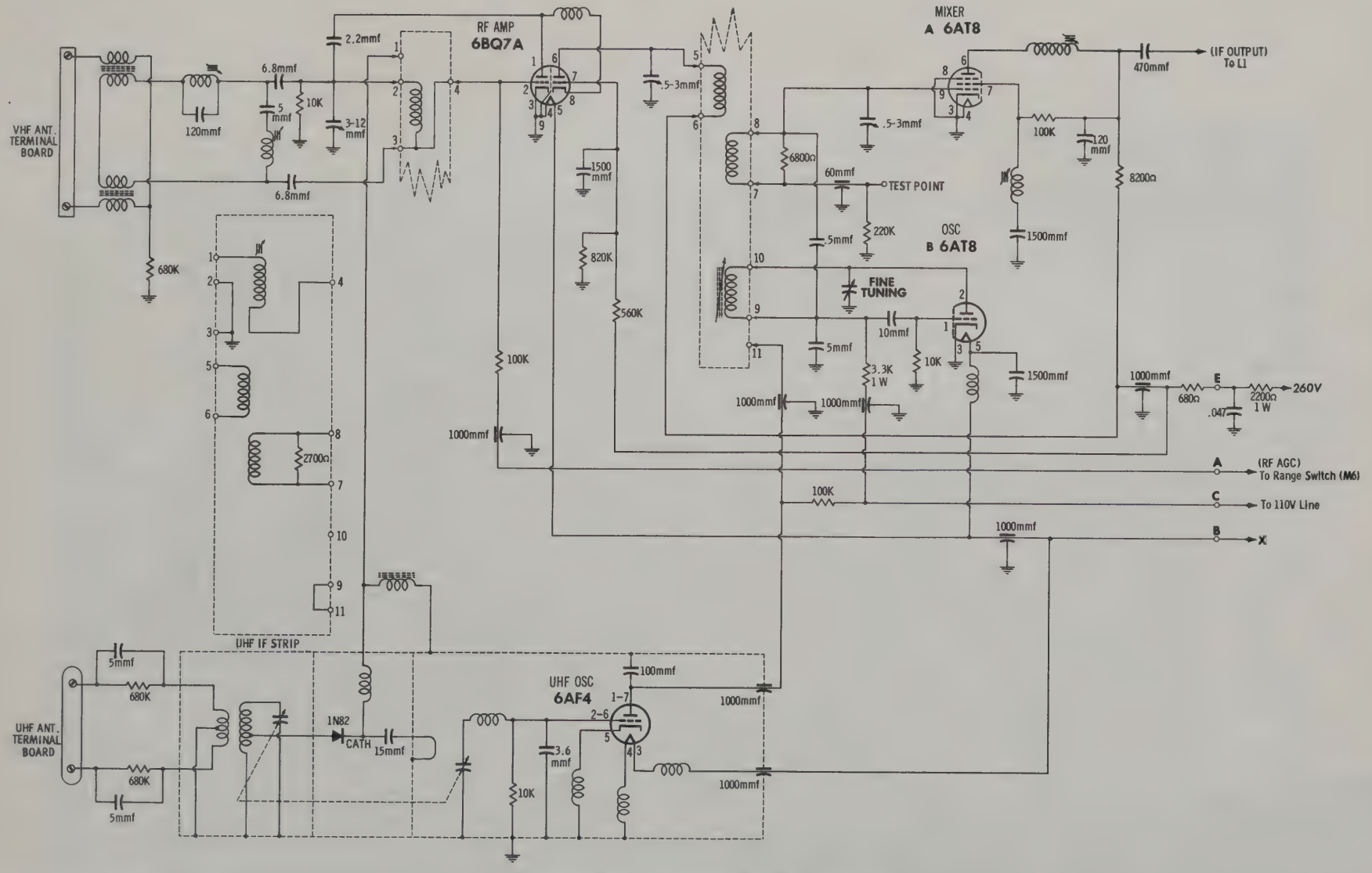
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V16

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V9
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V17
Has pic, no sound - V7, V8, V9
Overloaded picture - V8

SYNC FAILURE
No vert. sync - V10, V11
No horiz. sync - V10, V12
No vert. or horiz. sync - V10

SWEEP FAILURE
No raster, has sound - V12, V13, V41, V15, V17, Fuse (M1)
No vertical deflection - V11
Poor vert. linearity or foldover - V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V13, V14, V15, V16
Vert. off freq. - V10, V11
Horiz. off freq. - V10, V12



UHF-VHF Tuner Part No. 10550 & 10552 - Used In Models 17VT1-U & 21VT1-U

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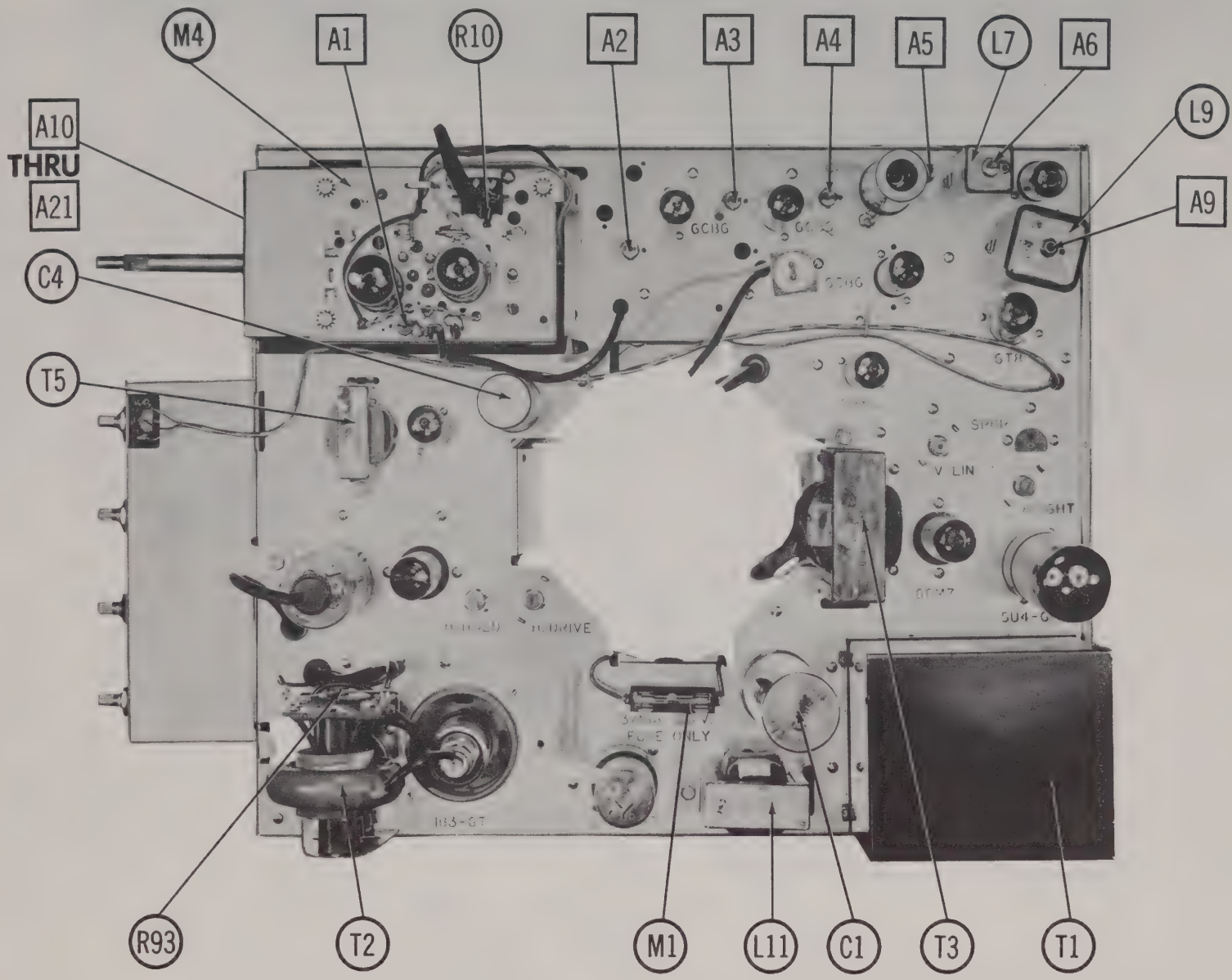
ALTERNATE VHF-UHF TUNER SCHEMATIC



CHASSIS TOP VIEW

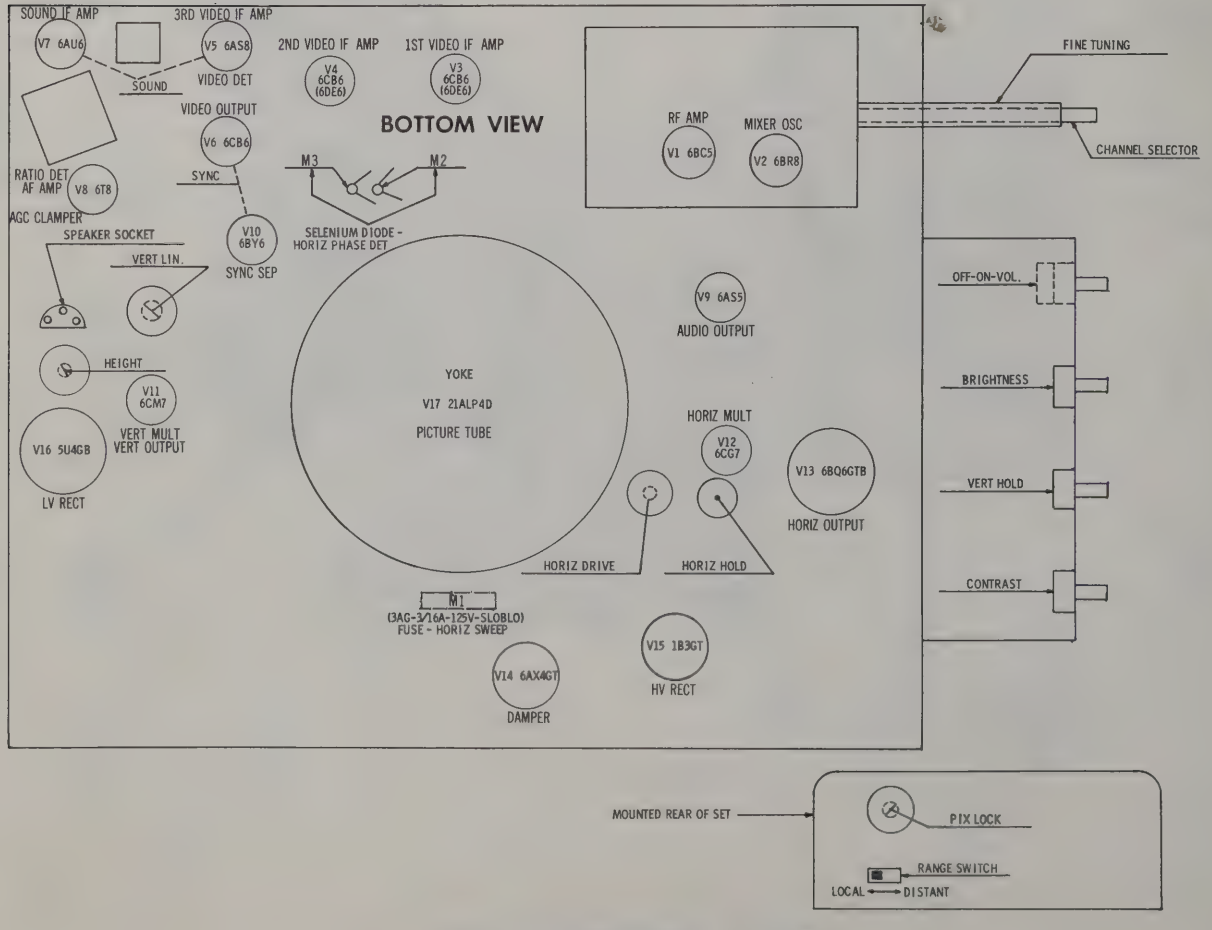
PACKARD-BELL MODELS
17VT1, -U, 21VT1, -U (Ch. V8-1)

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BC5	2.2Meg	0Ω	.1Ω	0Ω	■ 0Ω	■ 0Ω	0Ω		
V2	6BR8	10K	■ 4700Ω	0Ω	.1Ω	0Ω	■1000Ω	■10K	0Ω	220K
V3	6CB6	2.2Meg	68Ω	0Ω	.1Ω	▲470Ω	▲470Ω	0Ω		
V4	6CB6	60K	▲68Ω	0Ω	.1Ω	†1000Ω	†1000Ω	65K		
V5	6AS8	■ 1000Ω	.1Ω	270Ω	.1Ω	0Ω	3300Ω	0Ω	.1Ω	■1000Ω
V6	6CB6	470K	● 230Ω	0Ω	.1Ω	†4700Ω	80K	● 230Ω		
V7	6AU6	2.5Ω	0Ω	0Ω	.1Ω	■10K	■ 10K	150Ω		
V8	6T8	INF	20K	INF	0Ω	.1Ω	60K	0Ω	4.7Meg	■220K
V9	6AS5	■270Ω	470K	.1Ω	0Ω	470K	†300Ω	†600Ω		
V10	6BY6	● 200K	0Ω	0Ω	.1Ω	■ 250K	†15K	2.2Meg		
V11	6CM7	▲13K	NC	●120K	.1Ω	0Ω	●▲2.5Meg	470K	●2Meg	180Ω
V12	6CG7	†8200Ω	3Meg	2700Ω	.1Ω	0Ω	†150K	100K	2700Ω	0Ω
V13	6BQ6GTB	TP	.1Ω	NC	†12K	● 400K	NC	0Ω	0Ω	Top Cap ▲11.5Ω
V14	6AX4GT	NC	NC	200K	NC	†48Ω	NC	0Ω	.1Ω	
V15	1B3GT		PINS	1 - 8	HAVE	INFINITE	RESISTANCE			Top Cap ▲330Ω
V16	5U4GB	NC	20K	NC	27Ω	NC	24Ω	NC	20K	
V17	21ALP4D	0Ω	0Ω	Pin 6 ▲12K	Pin 10 ▲1Meg	Pin 11 †200K	Pin 12 .1Ω			

■ MEASURED FROM 110V LINE.
▲ MEASURED FROM PIN 7 OF V4.
† MEASURED FROM PIN 2 OF V16.
▲ MEASURED FROM PIN 3 OF VI4.

● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
TP TIE POINT
NC NO CONNECTION



TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped away from the chassis.
Do not remove the horizontal oscillator tube (V12) from its socket to disable the high voltage.
Allow 10 minutes warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Do not connect a negative voltage to the AGC line.
Set generator output at maximum.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	44.8MC	Any non-interfering channel.	DC probe to point Ⓐ. Common to chassis.	A1	Adjust for maximum output.
2.	"	"	42.50MC	"	"	A2	"
3.	"	"	45.0MC	"	"	A3	"
4.	"	"	44.0MC	"	"	A4	"
5.	"	"	43.25MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 5MFD, 50 volt capacitor to the ungrounded side of C28. Connect positive lead to chassis.
Couple a second signal generator to an ungrounded tube shield floating over converter tube (V2) to provide marker on response curve.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	63MC (10MC Swp)	41.25MC 42.25MC 45.0MC 45.75MC	3	Vert. amp. thru 22KΩ to point Ⓑ. Low side to chassis.		Check for response similar to Fig. 1. Adjust A2 for the overall band width. Adjust A1 to place the 45.75MC marker at 50% on the response curve. Adjust A3 for the position of 45.0MC marker on response curve. Adjust A4 to place 41.25MC marker in position and to correct bottom portion of response curve. A5 controls position of curve on low frequency side. Note position of 45.0MC marker on response curve. It should not exceed this position.

4.5MC TRAP ALIGNMENT

If a 4.5MC signal generator of crystal accuracy capable of at least one volt output is not available tune in a TV station and adjust A6 for MINIMUM 4.5MC beat interference in the picture.
Adjust contrast control fully clockwise. Remove the third video IF tube (V5) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.001MFD	High side to point Ⓑ. Low side to chassis.	4.5MC (unmod)	Any	DC probe thru detector (Fig. 2) to pin 11 (cathode) of picture tube. Common to chassis.	A6	Adjust for MINIMUM deflection with signal generator output at least 1 volt.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Remove the third video IF tube (V5) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001MFD	High side to point Ⓑ. Low side to chassis.	4.5MC (unmod)	Any	DC probe to point Ⓒ. Common to chassis.	A7, A8	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point Ⓓ. Common to point Ⓔ.	A9	Adjust for zero reading. A positive and a negative reading will be obtained on either side of the correct setting. Replace V5 in its socket.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove the third video IF tube (V5) from its socket.
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.001MFD	High side to point Ⓑ. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point Ⓒ. Low side to chassis.	A7, A8	Disconnect stabilizing capacitor (C3). Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
9.	"	"	"	"	"	Vert. amp. to point Ⓓ. Low side to chassis.	A9	Reconnect C3. Adjust A9 so that 4.5MC occurs at center of response curve as in Fig. 4. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines. Replace V5 in its socket.

TUNER ALIGNMENT

This portion of the receiver have been properly aligned at the factory and are very stable. Alignment of this portion should not be required in the field.

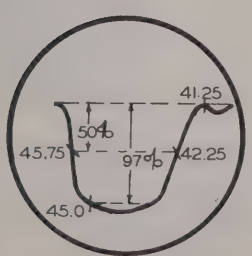


FIG. 1

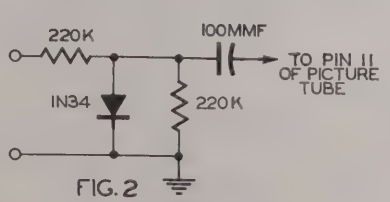


FIG. 2

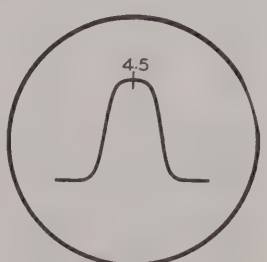


FIG. 3

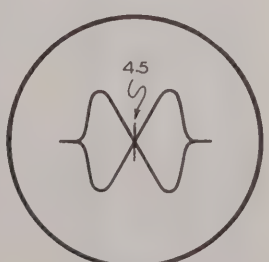


FIG. 4

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BC5	
V2	Mixer—Oscillator	6BE8	
V3	1st Video IF Amplifier	6CB6	Note 1
V4	2nd Video IF Amplifier	6CB6	Note 1
V5	3rd Video IF Amplifier-Video Detector	6AS5	
V6	Video Output	6CB6	
V7	Sound IF Amplifier	6AU8	
V8	Ratio Det.-AF Amplifier-AGC Clamper	6T8	

ITEM No.	USE	TYPE	NOTES
V9	Audio Output	6AB5	
V10	Sync Separator	6BY5	
V11	Vert. Mult.-Vert Output	6CM7	
V12	Horiz Mult	6CG7	
V13	Horiz Output	6DQ6GTB	
V14	Damper	6AX4GT	
V15	HV Rectifier	1B3GT	
V16	LV Rectifier	5U4GB	

Note 1. 6DE5 may be used in some models.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	Packard-Bell PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V17	21ALP4D 1	21ALP4D 1	21ALP4A B 1/	21ALP4A 2/	1/ Aluminized 2/ Silver Screen "85"
		21ALP4A 1	21ALP4A 1		
		21ALP4 1	21ALP4 1		
	17AVP4A 1	17AVP4A 1	17AVP4A 1		
				17AVP4 1	
				17AVP4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP	RATING VOLT	Packard-Bell PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	NOTES
C1A	●100	350	24109	APH4-94-90		FP337.7	TMT-105		T-115	R3293*
B	●100	350				TC83	TD-10-475		MT-4710	
C	●20	475								
C2	25	25	24006A	PRS25V25	BR253	TC36	TD-25-25	PM-0325	TVA-1205	
C3	50	50	24108	BR50V5	BR550	TC30	TD-50-50	PM-0550	MMT-0505	TVA-1303
C4A	●10	350	24110	APH3-114-60	BL8011	FP331	TMD-37		D-115	R2284 *
B	●40	100			BR1258	TC83	TD-12-250		TM-5512	
C	●40	200								

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP	RATING VOLT	Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	5			NPO-DIS 3		Z016	NPOA-SR2			
C2	3-8				829-U					
C3	1000									
C4	5-3			829-3		3125-01-SR5	CT565A			
C5	1000									
C6	1000									
C7	1000									
C8	5-3			829-3		3125-01-SR5	CT565A			
C9	5-8			TCZ-SR5						
C10	1000									
C11	1000									
C12	5-8									
C13	5									
C14	5									
C15	10									
C16	1000									
C17	1000									
C18	1000			N750-DH100	TCH-100	TK30	N750L-101	M7-531	STCU-T1	
C19	470			RPD-0004T	DD-471	K066	811-471	UC-5347	SGA-T47	
C20	.1	200	23307	PRS20V-.1	DF-104	CUD2S2P1		DT-1041	DT-1041	
C21	1000		23965	RPD-001	DD-103	K069	801-001	DC-531	SHK-D1	
C22A	10000		23963	RPD-2EXU	DD363-103	DE363	811-01	DC-511	SHK-E01	Note 1
B	10000						811-01	DC-511		Note 1
C23	1000		23965	RPD-001	DD-103	K069	801-001	DC-531	SHK-D1	
C24	1000		23965	RPD-001	DD-103	K069	801-001	DC-531	SHK-D1	
C25	10000		23963	RPD-1EXU	DD363-103	DE363	811-01	DC-511	SHK-E01	Note 1
C26A	10000		23963	RPD-1EXU	DD363-103	DE363	811-01	DC-511	SHK-E01	Note 1
B	10000						811-01	DC-511		Note 1
C27	4.7		23978	NPO-D24.7	TCZ-4R7	Z020	NPOA-4R7	DT-5347	STCCB-V47	
C28	.047	200	23305	PS20S-47		CUB2P32		PT4027	STM-P32	
C29	.047	200	23305	RPD-D6	DF-503	CUB2S47		PT4167	STM-S47	
C30	.1	200	23307	PS20V-.1	DF-104	CUB2P1		PT4041	STM-P1	
C31	01	600		RPD-01	DS-103	CUD2S1	GP3-333-103	PT511	STM-S1	
C32A	10000		23962	RPD-2EXU	DD363-103	DE363	811-01	DC-511	SHK-E01	Note 1
B	10000						811-01	DC-511		Note 1
C33	5000		23931	RPD-D06	DD-502	K060	811-005	DC-5125	SHK-D5	
C34	400	400	23311	DE-503	DS-503	CUB4D3	GP3-333-309	PT933	STM-D3	
C35	.047	200	23305	RPD-D6	DF-503	CUB2S47		PT4167	STM-S47	
C36	1000	500	23969	RPD-01	DD-102	K069	811-01	DC-511	SHK-E1	
C37	082	600	23341	RPD-01	DF-503	CUB5S22	817-02	PT5133	STM-S22	
C38	.0033	600	23325	RPD-0033	DF-333	CUB4S33	GP3-333-223	PT4133	STM-S33	
C39	033	400	23335	RPD-03	DF-303	CUB4S22	817-02	PT4125	STM-S22	
C40	50		23923	RPS-05S0	TCS-50	TK34	NPO-337-505			Note 2
C41	.0033	400	23317	RPD-0033	DS-333	CUB4D33	GP3-333-309	PT3333	STM-D33	
C42	330		23315	DL-0033	DD-331	TP29	811-331	UC-5323	SGA-T 32	
C43	.1	300	23307	PS30V-.1	DF-104	CUB3P1		PT4031	STM-P1	
C44A	3000									Note 3
B	5000		123618	1PA-1S0	1PC-100	1TS1TM1	11405-01		TY-1	Note 3
C	5000									Note 3
C45	.01	600	23329	RPD-01	DS-103	CUD6S1	GP3-333-103	PT511	STM-S1	
C46	1000		23965	RPD-001	DD-102	K069	801-001	DC-531	SHK-D1	
C47	1000		23965	RPD-001	DD-103	K069	801-001	DC-531	SHK-D1	
C48	.1	300	23307	PS30V-.1	DF-104	CUB3P1		PT4041	STM-P1	
C49	.047	600	23343	RPD-05	DF-503	CUB6S47		PT5167	STM-S47	
C50	.1	600	23343	PS60S-.1	DF-104	CUB6P1		PT5041	STM-P1	
C51	.047	300	23335	RPD-05	DF-503	CUB3S47		PT4167	STM-S47	
C52	01				TCZ-S	TZ39	NPO-337-S0			Note 4
C53	1000		23969	NPO-DH10	TCS-1S0	TZ33	NPO-333-1S1		STCC-T12	
C54	.15	300	23305	PS30S-15		CUB3P15		PT4015	STM-P15	
C55	1000		23965	RPD-001	DD-103	K069	801-001	DC-531	SHK-D1	
C56	4500	500	23336	1664-004		1RSD4		MCB463	MB-24	
C57	470	500	23336	1664-00047		SRS T4T			MB-347	
C58	330	500	23331							
C59	.0033	600		1664-0033		1RSD33			MB-333	Note 5
C60	033	600	23341	RPD-03	DF-303	CUB6S22	817-02	PT5133	STM-S22	
C61	1000		23961	RPD-006	DD-502	K060	811-005	DC-5125	SHK-D5	
C62	.1	600	23345	PS60V-.1	DF-104	CUB6P1		PT5041	STM-P1	
C63	10000		23969	RPD-01	DD-103	K069	811-01	DC-511	SHK-E1	
C64	.047	600	23345	RPD-05	DF-503	CUB6S47		PT5167	STM-S47	
C65	.1	600	23345	PS60S-1	DF-104	CUB6P1		PT5041	STM-P1	
C66	120	3000	23976		DD60-121				20GA-T12	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Packard-Bell PART No.	IRC PART No.	NOTES
R10	680K			BTS-680K	
R11	4700Ω			BTS-4700	
R12	5600Ω				
R13	6800Ω			BTS-6800	
R14	330K			BTS-330K	
R15	10K				
R16	4700Ω			BTS-4700	
R17	10K			BTS-10K	
R18	1000Ω			BTS-1000	
R19	68K			BTS-68K	
R20	2.2Meg		TS165	BTS-2.2Meg	
R21	150Ω		T3014	BTS-150	
R22	10K		T3037		
R23	470Ω		T3031	BTS-470	
R24	68Ω		T3011	BTS-68	
R25	6800Ω		T3035		
R26	12K 5%		T3038		
R27	1000Ω		T3035	BTS-1000	
R28	130K		T3050	BTS-130K	
R29	330K		T3050	BTS-330K	
R30	68Ω		T3011	BTS-68	
R31	6800Ω		T3035		
R32	1000Ω		T3035	BTS-1000	
R33	270Ω		T3018	BTS-270	
R34	2.2Meg		T3165	BTS-2.2Meg	
R35	1500Ω		T3037	BTS-1500	
R36	1800Ω		T3038	BTS-1800	
R37	470K		T3157	BTS-470K	
R38	4700Ω	2	T3453	BTS-4700	
R39	150Ω		T3015	BTS-150	
R40	56K		T3046	BTS-56K	
R41	220K		T3153	BTS-220K	
R42	1Meg		T3051	BTS-1Meg	
R43	15K 5%		T3039-1	BTS-15K 5%	
R44	10K	1	T3037	BTA-10K	
R45	150Ω		T3015	BTS-150	
R46	470Ω		T3031	BTS-470	
R47	27K		T3043	BTS-27K	
R48	10K		T3037	BTS-10K	
R49	10K		T3037	BTS-10K	
R50	56K		T3046	BTS-56K	
R51	4.7Meg		T3169	BTS-4.7Meg	
R52	4.7Meg		T3169	BTS-4.7Meg	
R53	220K		T3153	BTS-220K	
R54	470K		T3157	BTS-470K	

ITEM No.	RATING OHMS	RATING WATT	Packard-Bell PART No.	IRC PART No.	NOTES
R55	3700		T3018	BTS-370	
R56	2700		T3018	BTS-270	
R57	33K		T3043	BTS-33K	Note 1
R58	150K		T3051	BTS-150K	
R59	39K		T3044	BTS-39K	
R60	470K		T3157	BTS-470K	
R61	1.5Meg		T3161	BTS-2.2Meg	
R62	22K	2	T3441	BTB-22K	Note 3
R63	8200Ω	2	T3439	BTS-8200	
R64	560K		T3159	BTS-560K	
R65	33K		T3043	BTS-33K	
R66	470K		T3157	BTS-470K	
R67A	22K			BTS-22K	Note 10
B	8200Ω		†T3018	BTS-8200	Note 10
C	6200Ω			BTS-6200	Note 10
R68	470K		T3157	BTS-470K	
R69	56K		T3046	BTS-56K	
R70	22K		T3041	BTS-22K	
R71	1.5Meg		T3161	BTS-1.5Meg	
R72	180Ω		T3016	BTS-180	
R73	470K		T3157	BTS-470K	
R74	150K		T3051	BTS-150K	
R75	270K		T3054	BTS-270K	
R76	33K		T3041	BTS-33K	
R77	220K		T3153	BTS-220K	
R78	5600Ω		T3032		
R79	5600Ω		T3032		
R80	1Meg		T3051	BTS-1Meg	
R81	1Meg		T3051	BTS-1Meg	
R82	2200Ω			BTS-2200	Note 7
R83	1Meg		T3161	BTS-1Meg	Note 7
R84	47K		T3045		
R85	2500Ω				Note 6
R86	100K				Note 6
R87	100K		T3031		
R88	2700Ω		T3030	BTS-2700	Note 8
R89	220K		T3153		
R90	680K		T3060		
R91	680K		T3060		
R92	10K	4			Note 6
R93	10K	2	T3037		
R94	10K	2	T3434	BTS-10K	
R95	100K		T3049	BTS-100K	
R96	560Ω				Note 9

† Items R57A, R57B, R57C, C44A, C44B and C44C are combined in one unit.

Note 1: In chassis marked below 980, 470K resistor is used in this application. (Part #T3037)

Note 2: Used with heat dissipation band. If band is not used, wattage must be doubled.

Note 3: Used in chassis marked 946 or higher.

Note 4: In chassis marked below 946, a 68000 resistor is used in this application. (Part #T3035)

Note 5: In chassis marked below 946, an 82Ω resistor is used in this application. (Part #T3049-1)

Note 6: Some versions use a 12K 5W resistor in this application. (Part #T3438)

Note 7: In chassis marked 1005 or higher, a 120K resistor is used in this application.

Note 8: In chassis marked 1014 or higher, a 33000 resistor is used in this application.

Note 9: Used in chassis marked 1006 or higher.

Note 10: Early production models use integrator. (part #23980)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C67A	10000	125VAC	23982A		BPD-2X01	DDM2-102	DK063	811-01	DC-511	SHK-E01	
B	10000	125VAC						811-01	DC-511		Note 2
C68	.0047	600									

† Items C44A, C44B, C44C, R67A, R67B and R67C are combined in one unit.

Note 1. Some versions use a single unit in this application.

Note 2. Not used in some versions.

Note 3. Early production models use integrator (part #23980) connected in series with .0033MFD.

Note 4. Some versions use .056MF unit (part #23969) in this application.

Note 5. Some versions use .0033MFD unit (part #23965) in this application.

CONTROLS

ITEM No.	RATING RESIST ANCE	RATING WATTS	Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	1	25005A	AB-50	A47-500K-J	Q13-133	U48	Volume
B	Shaft		Not Req.	AK-4	ES8-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	ED-1	SWS-12	7B-1	US-58	Attach to R1A
R2A	50K	½	25006A	AB-51	A47-50K-S	Q11-123	U35	Brightness
B	Shaft		Not Req.	AK-4	ES8-3	Not Req.	Not Req.	Attach to R2A
R3A	150K	½	25005A	AB-43	A47-150K-S	Q11-133	U43	Vert. Hold
B	Shaft		Not Req.	AK-4	ES8-3	Not Req.	Not Req.	Attach to R3A
R4A	1000Ω	½	25004A	AB-505		Q17-108	U3	Contrast
B	Shaft		Not Req.	AK-4		Not Req.	Not Req.	Attach to R4A
R5A	50K	½	25909	BE-52	A47-50K-S	Q11-123	PTA541	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FE28-1/4	Not Req.	Not Req.	Attach to R5A
R6A	3Meg	½	25937	AB-94	A47-3Meg-S	Q11-140	TA381	Vert. Linearity
B	Shaft		Not Req.	AK-1	FE28-1/4	Not Req.	Not Req.	Attach to R6A
R7A	5Meg	½	25910	AB-97	A47-5Meg-S	Q11-141	PTA95L	Height
B	Shaft		Not Req.	AK-10	FE28-1/4	Not Req.	Not Req.	Attach to R7A
R8A	7.5Meg	½	25911	AB-98	A47-7.5Meg-S	Q11-143	PTA855L	Picture Lock
B	Shaft		Not Req.	AK-10	RN-5	Not Req.	Not Req.	Attach to R8A
R9	500	½						AGC Overload-Delay-Note 1

Note 1: Used in chassis stamped 997 only.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T3	Horiz. Output Trans.	49465	PB4204-L①	RVO-54+1			C-8259+1	A-8259+1 ①	D-49+1 ①
T3	Vert. Output Trans.	49434C	41806	A-5039	23871	V312	A-8141	28854	A-804X
T4A	Yoke(90°)-Horiz.(25M1)	295908					DY-23A ③		
B	Vert.(60CPS)	295455A ②							

① Drill new mounting hole(s).
② Yoke rear cover and centering device.
③ Use original rear cover and centering device.
④ Use original horiz. yoke damping network.
† This part may be superseded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8	5	5		5	5	5	5
5	4	4		4	4	4	6
4	N. C. See Note 3	N. C. See Note 3		N. C. See Note 3	N. C. See Note 5	N. C. See Note 5	N. C. See Note 3
2	1	1		1	1	1	2
Special Notes →	③	③	③	③	③	③	③

① To reduce yoke "ringing", install 1000Ω in series with capacitor C66.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	4.7KΩ	3-4Ω	89438A	S1107	A3930	A-3850	24851	S-3X	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD V. C. IMP.	REPLACEMENT DATA Packard-Bell PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"	PM 3-4Ω	85014	4A07	22351	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Packard-Bell PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	1st Video IF	.1Ω	.1Ω	29584			TV-151	
L2	2nd Video IF	.1Ω	.1Ω	29585	17-4523	TV-130	6319	
L3	3rd Video IF	.1Ω	.1Ω	29586A	17-4534	TV-130	6319	
L4	4th Video IF	.1Ω	.1Ω	29587	17-4535	TV-180	6319	
L5	Series Peaking Coil	1.5Ω		29568	19-1006		6612	10 Microhenries
L6	Shunt Peaking Coil	9.5Ω		29569	19-4180	TV-183	6179	180 Microhenries, Wound on 39KΩ Resistor
L7A	4.5MC Trap	1.5Ω						
B	Sound IF	3.6Ω		29563				
L8	Shunt Peaking Coil	14Ω		29577	19-6400*		6136*	400 Microhenries, Wound on 18KΩ Resistor
L9	Ratio Det.	3.6Ω	3Ω CT	29054	17-3493	TV-115a	1498	Tertiary Winding - .7Ω

* Parallel with 18KΩ resistor.
a Use adaptor plate.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Packard-Bell PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L10	75Ω		29629		19-1576	TV-183	6310		R8-5	

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 (%)	REPLACEMENT DATA Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L11	1.20A	38.5Ω	18H	27006B	C5040	C-3984	C-8327	20C41	C-35X ①

①Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Packard-Bell PART No. FUSE	HOLDER	LITTELFUSE PART No. FUSE	HOLDER	BUSS PART No. FUSE	HOLDER
M1	3AG S/B	3/4A 125V	45008		313.187 (3AG-S/B) 3/4A)	357001	MDL 3/4	4405

TRANSFORMER (POWER)

ITEM No.	PRI.	SEC. 1	SEC. 2	SEC. 3	Packard-Bell PART No.	REPLACEMENT DATA Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ②①	520VCT ②	5V ③	12, 6VCT ④	89059		P-2830 ②③		28R33 ①③	R-51BC ①③

① Connect in series and phase 6.3V ⑤, 5A windings.
② Tape 5.3V ⑥1.2A winding.
③ Connect in series and phase 6.3V ⑤ 6A windings.
④ Tape 5V ⑥ 3A winding.

PACKARD-BELL MODELS
17VT1, -U, 21VT1, -U (Ch. V8-1)

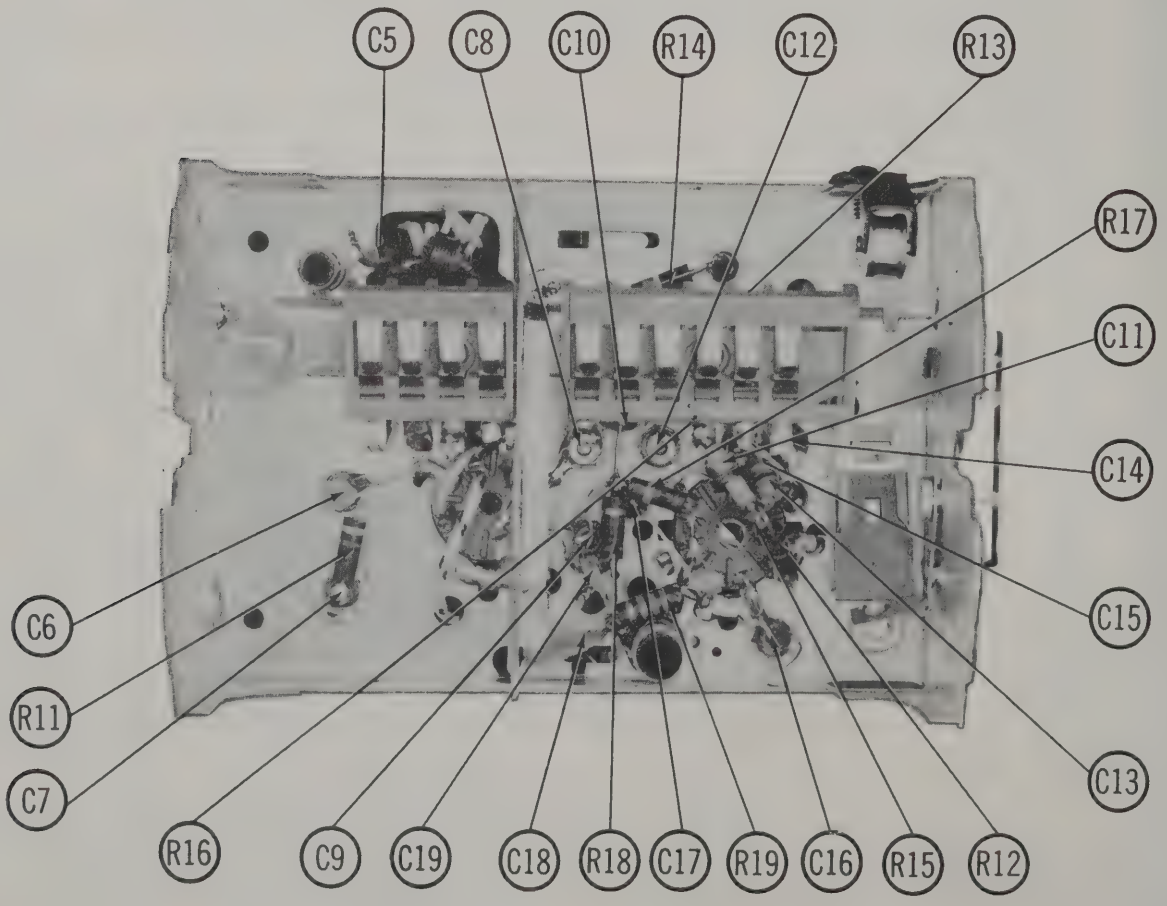
PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

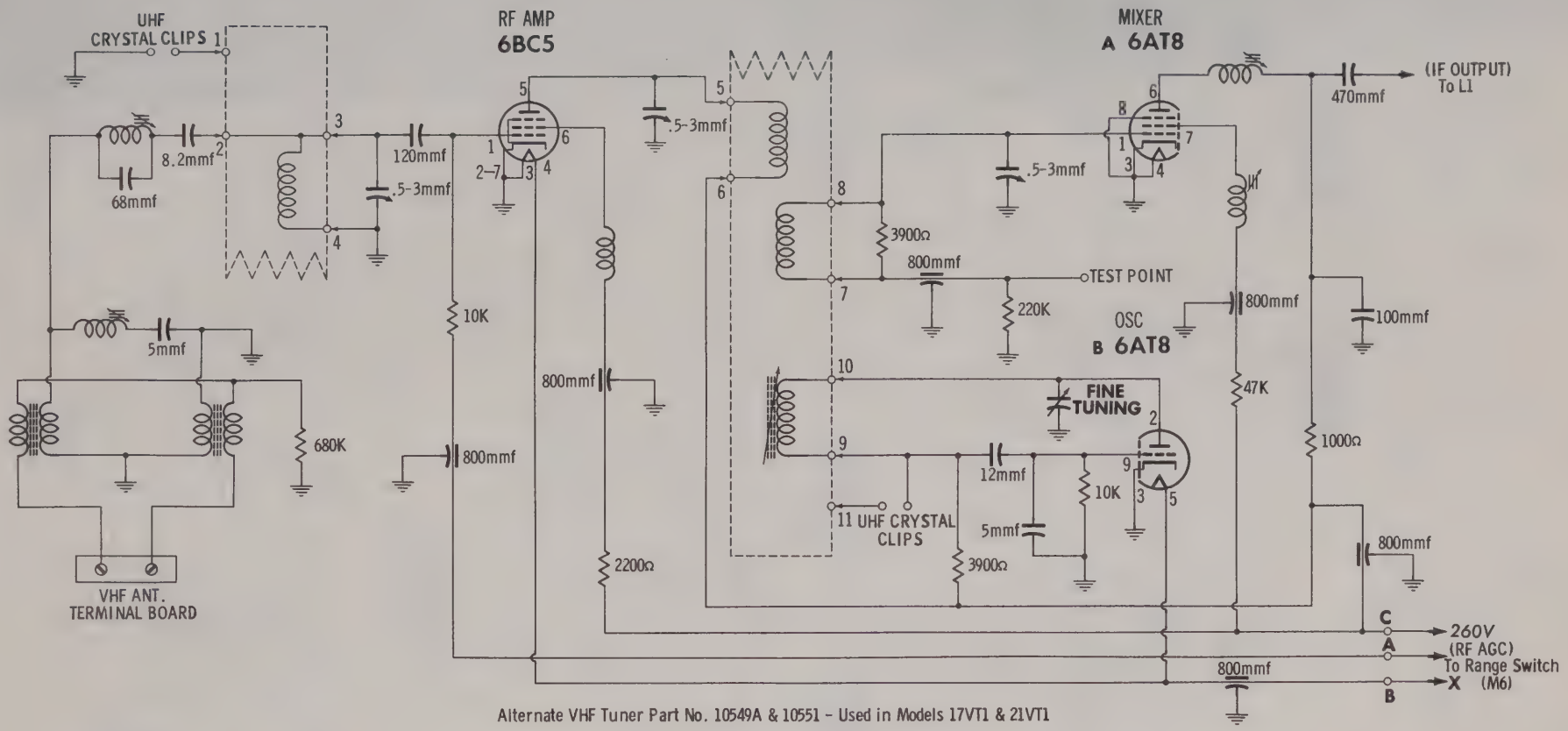
ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Packard-Bell PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M2		72017	1215	1T1				
M3		72017	1215	1T1				

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M4	Tuner	10554	VHF-Model 17VT1, not used in some versions.
	Tuner	10549A	VHF-Model 17VT1, not used in some versions.
	Tuner	10555	VHF-Model 21VT1, not used in some versions.
	Tuner	10551	VHF-Model 21VT1, not used in some versions.
M5	Tuner	10550	(VHF-UHF Combination) Model 17VT1-U
	Tuner	10552	(VHF-UHF Combination) Model 21VT1-U
M6	Switch		Range (DPDT-Slide Type) Switch Replaced By R9 in Chassis Stamped 997.
M7	Centering Device	34045A	Includes Deflection Yoke (T4) Rear Cover
M8	Ion Trap	28106A	
	Cabinet		Specify Model Number & Finish
	Knob	52151	Channel Selector - Models 17VT1, 21VT1 Specify Cabinet Finish.
	Knob	52152	Fine Tuning - Models 17VT1, 21VT1 Specify Cabinet Finish.
	Knob	52157	Fine Tuning - Models 17VT1-U, 21VT1-U Specify Cabinet Finish.
	Knob	52158	VHF Tuning -Models 17VT1-U, 21VT1-U Specify Cabinet Finish.
	Knob	52159	UHF Dial - Models 17VT1-U, 21VT1-U Specify Cabinet Finish.
	Knob	52156-1	On-Off-Volume (Specify Cabinet Finish.)
	Knob	52156-2	Vertical Hold (Specify Cabinet Finish.)
	Knob	52156-3	Brightness (Specify Cabinet Finish.)
	Knob	52156-4	Contrast (Specify Cabinet Finish.)
	Safety Glass	55070A	Models 17VT1, 17VT1-U
	Safety Glass	55073A	Models 21VT1, 21VT1-U
	Mask	55071B	Models 17VT1, 17VT1-U
	Mask	55074	Models 21VT1, 21VT1-U



RF TUNER BOTTOM VIEW



Alternate VHF Tuner Part No. 10549A & 10551 – Used in Models 17VT1 & 21VT1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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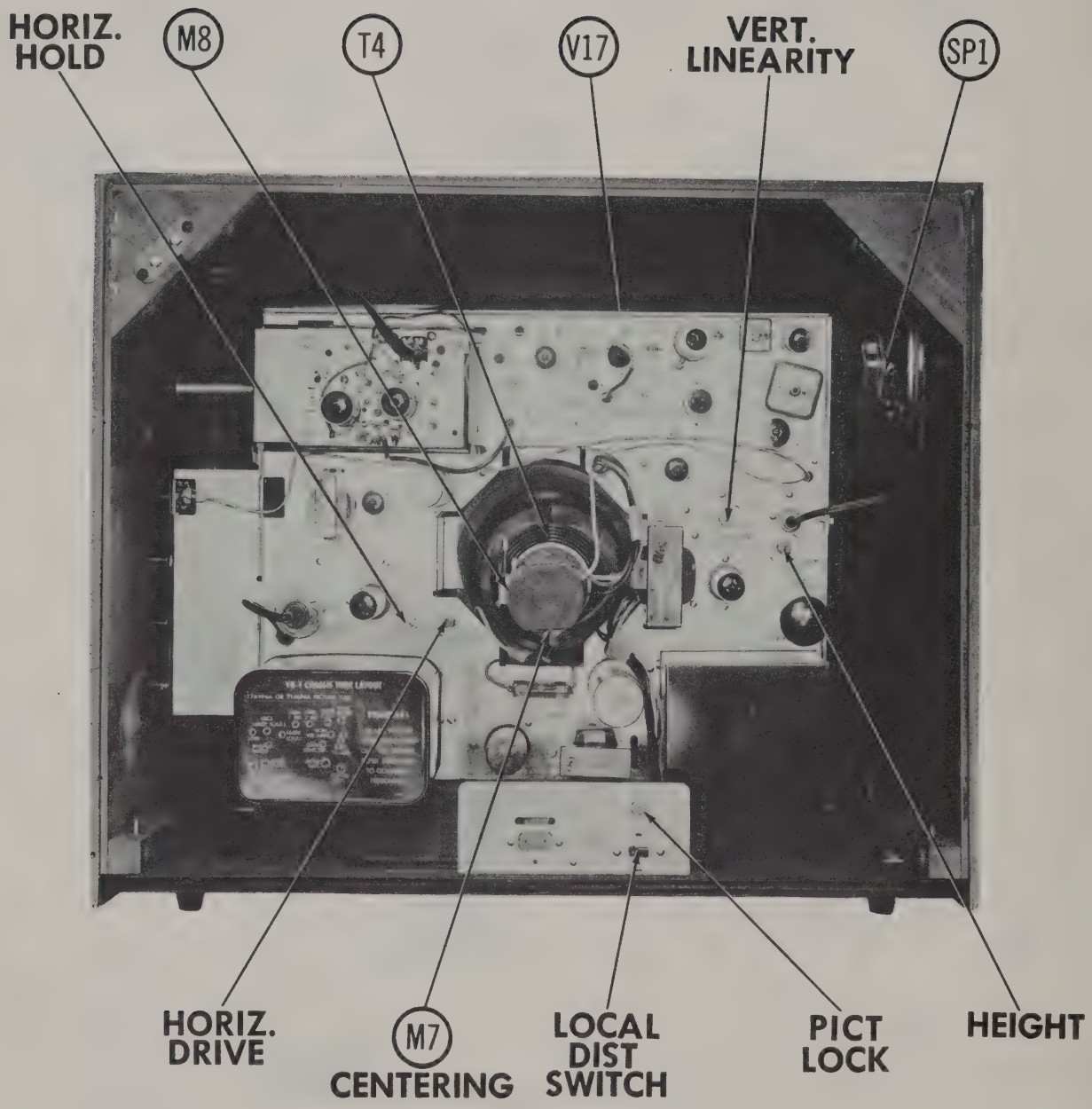
ALTERNATE VHF TUNER SCHEMATIC



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.
Adjust the horizontal hold until the picture synchronizes horizontally. The proper setting for the horizontal hold is half-way between the two points where the picture starts to tear.
Adjust the horizontal drive control (R5) in a clockwise direction as far as possible without the presence of vertical white lines or compression near the center of the screen.

PHOTOFACT* Folder

*TRADE MARK

PHILCO MODELS 22D4148, L, 22D4162, L, 22D4163M, 22D4164 (Ch. TV-440)

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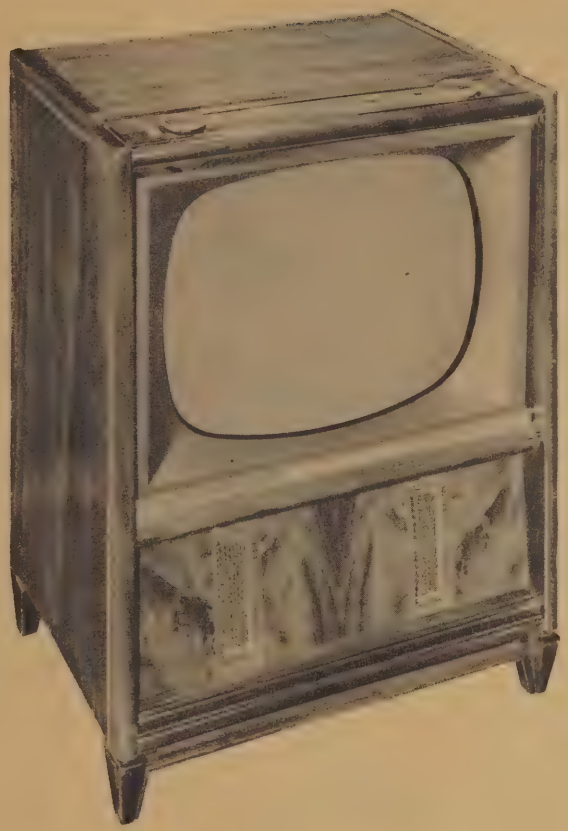

PHILCO MODEL 22D4163M

TRADE NAME	Philco Models 22D4148, 22D4148L, 22D4162, 22D4162L, 22D4163M, 22D4164 (Ch. TV-440)
MANUFACTURER	Philco Corp., Tioga & "C" Streets., Philadelphia, Pa.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.8 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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PHILCO MODELS 22D4148, L, 22D4162, L, 22D4163M, 22D4164 (Ch. TV-440)

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove channel selector, fine tuning, tone and volume control knobs.

2. Remove 2 phillips-head screws from bar assembly so that 5 small control knobs may be removed.

3. Remove 2 hex-head screws holding control panel. Press the panel to the rear of the cabinet until trim at front is cleared. Hold panel at the volume and channel selector positions and pull panel forward and up until trim is cleared.

4. Lay panel on cabinet top so that off/on switch and stepper switch can be removed. Press dovetail end of switch unit down and slide free of mounting bracket.

5. Remove 7 wood screws. Remove rear cover.

6. Disconnect speaker leads.

7. Remove AC interlock bracket and "remote touch tuning socket" from cabinet.

8. Remove 2 wood screws holding 2 brackets from sides of cabinet.

9. Remove 2 chassis bolts, and 2 hex nuts at the top front holding picture tube and control panel bracket to cabinet.

10. Remove 2 hex nuts from bottom picture tube mounting bracket.

11. Remove chassis.

12. Remove 6 speaker nuts. Remove 2 speakers.

MODELS	CHASSIS
22D4148, 22D4148L, 22D4162, 22D4162L, 22D4163M, 22D4164	TV-440

PHILCO MODELS 22D4148, L, 22D4162, L, 22D4163M, 22D4164 (Ch. TV-440)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of the VHF tuner oscillator adjustments, it is necessary to remove the chassis from the cabinet. (See disassembly instructions).

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws holding metal molding at bottom edge of the safety glass. Remove molding and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set the horizontal hold control to the center of its range and adjust the horizontal oscillator control (R8) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L29) located on tube side of the chassis.

FUSES

Three fuses are used. One for LV power supply protection and 2 for remote control unit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

BUILT-IN ANTENNA TUNING

Built-in antenna can be adjusted from rear of the cabinet. Adjust for a picture of maximum contrast and minimum ghosts.

ANTI-PIN CUSHION ADJUSTMENT

Reduce the picture size so that the sides of the raster are visible, and position the magnets so that all sides are straight lines and the corners are at right angles.

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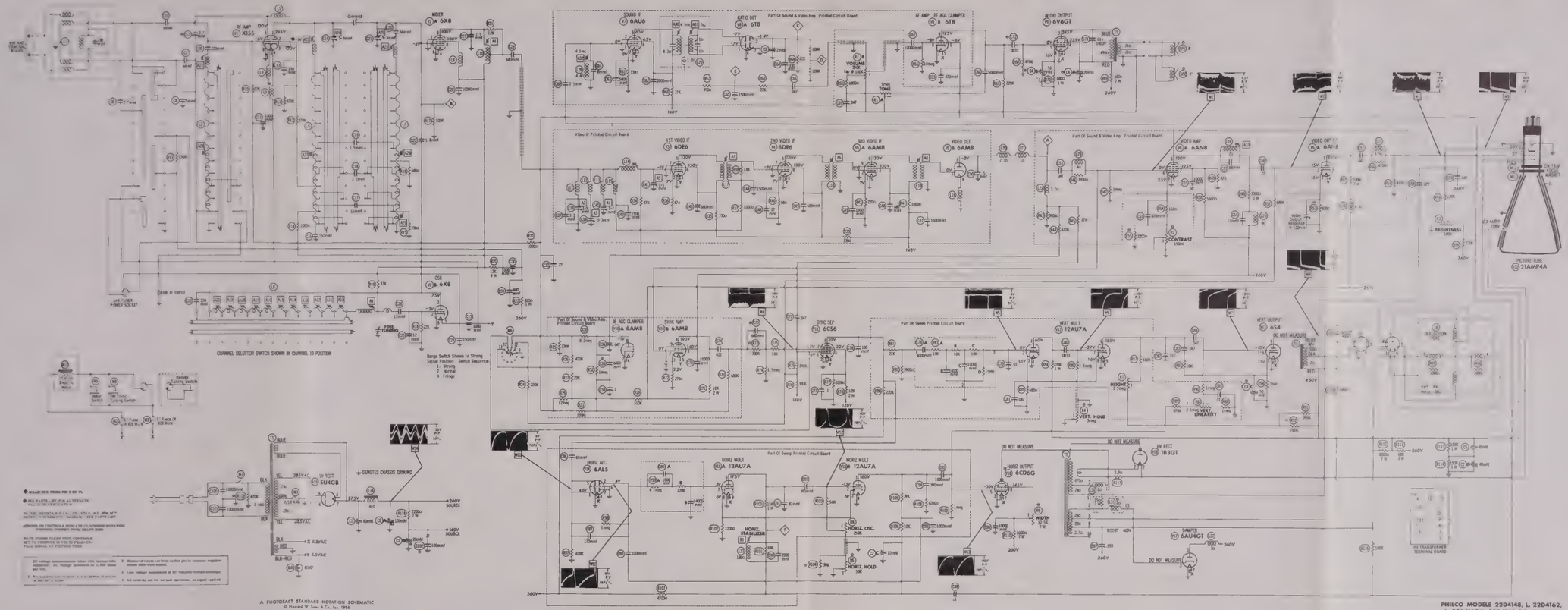
PHILCO MODELS 22D4148, L, 22D4162,
L, 22D4163M, 22D4164 (Ch. TV-440)
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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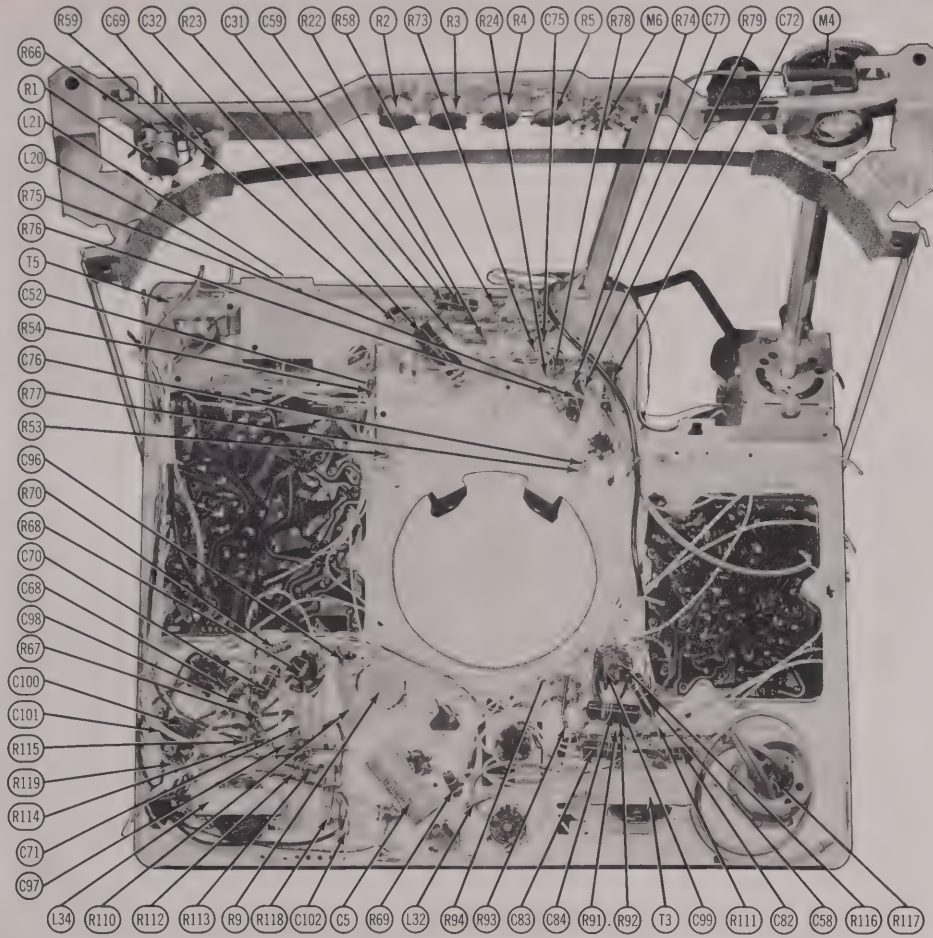
PHILCO MODELS 22D4148, L, 22D4162, L, 22D4163M, 22D4164 (Ch. TV-440)

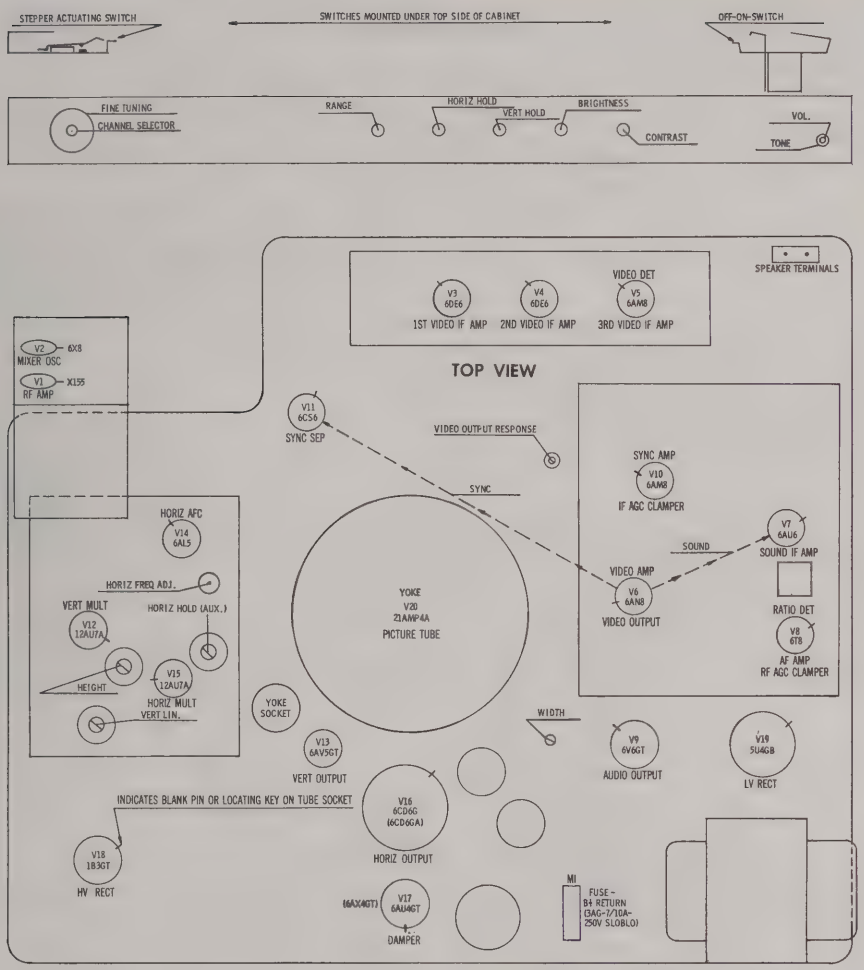
CHASSIS TOP VIEW

PHILCO MODELS 22D4148, L, 22D4162, L, 22D4163M, 22D4164 (Ch. TV-440)



CHASSIS-BOTTOM VIEW

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V19, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V10, V20
Has pic, no sound - V7, V8, V9
Overloaded picture - V8, V10

SYNC FAILURE
No vert. sync - V11, V12
No horiz. sync - V11, V14, V15
No vert. or horiz. sync - V10, V11

SWEEP FAILURE
No raster, has sound - V15, V16, V17, V18, V20
No vertical deflection - V12, V13
Poor vert. linearity or foldover - V12, V13
Poor horiz. linearity or foldover - V15, V16, V17
Narrow picture - V15, V16, V17, V18, V19
Vert. off freq. - V11, V12
Horiz. off freq. - V11, V14, V15

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Allow 15 minutes for receiver and test equipment to warm up. There must be a good bond between test equipment and chassis. Connect the deflection yoke and speaker during alignment. Do not remove the horizontal oscillator tube (V15) to disable the high voltage. The high voltage lead should be securely tape away from the chassis. The IF shield must be in place during alignment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 2.5 volt battery to the ungrounded side of C33. Positive lead to chassis. Connect the negative lead of a 5 volt battery to pin 8 (plate) of the 6AM8 (V10). Positive to chassis.
Set the range Switch to center position, contrast control fully clockwise and the volume control fully counter clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to point (B). Low side to chassis.	Not used.	41.25MC (400~ 30% Mod)	UHF	Vert. amp. thru 10K to point (A). Low side to chassis.	A1	Adjust for MINIMUM indication on scope.
2.	"	"	"	47.25MC	"	"	A2, A3	"
3.	"	"	"	45.0MC	"	"	A4	Adjust for maximum indication on scope. Use only enough sweep generator output to provide usable pattern on scope.
4.	"	"	"	42.7MC	"	"	A5, A6	"
5.	"	"	"	45.5MC	"	"	A7	"
6.	"	"	"	44.0MC	"	"	A8	"
7.	Fig. 1	Across antenna terminals thru matching network (Fig. 1).	69.0MC (6MC Swp)	67.25MC 70.75MC	4	"		Check response curve for curve limits and marker positions as in Fig. 2. If necessary, readjust A4 and A7 for proper curve level. A8 to level top of curve and A6 for proper slope on low frequency side of curve.

OSCILLATOR ALIGNMENT

Connect the negative lead of a 1.5 volt battery to the ungrounded side of C33. Positive to chassis.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	Not used.	257MC	13	Vert. amp. thru 10K to point (B). Low side to chassis.	A9	Adjust for zero beat. If regeneration occurs, increase bias; bias may be increased up to 4 or 5 volts if necessary.
				251MC	12		A10	
				245MC	11		A11	
				239MC	10		A12	
				233MC	9		A13	
				227MC	8		A14	
				221MC	7		A15	
				129MC	6		A16	
				123MC	5		A17	
				113MC	4		A18	
				107MC	3		A19	
				101MC	2		A20	

RF & MIXER ALIGNMENT

Leave bias connected as under "Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Fig. 1	Across antenna terminals thru matching network. (Fig. 1)	213MC (10MC Swp)	210MC 216MC	13	Vert. amp. thru 10K to point (A). Low side to chassis.	A21	Adjust for maximum output.
10.	"	"	"	213MC	"	"	A22, A23	Adjust for response similar to Fig. 3. Adjust A22 to set carrier level then adjust A23 for proper tilt.
11.	"	"	177MC (10MC Swp)	177MC	7	"	A24, A25	Check for response indicated by dotted lines in Fig. 4A and 4B. If necessary, adjust for mirror image of original response curve. (Tilt in opposite direction.) If response appears as in Fig. 4A, adjust A24 and A25 until curve appears as in Fig. 4B. This adjustment over compensates to allow for channel 13 adjustment. Repeat steps 10 and 11 until centered and symmetrical response curves are obtained on channels 7 and 13.
12.	"	"	85MC (10MC Swp)	85MC	6	"	A26, A27, A28	Adjust for symmetrical response approximately at center of bandpass. Adjust A26 counter clockwise until single peak appears. Adjust A27 until peak falls on 85MC marker. Adjust A28 for maximum amplitude and symmetry of single peak. Retouch SLIGHTLY if necessary, A26 and A27 for symmetrical response centered about the 85MC marker.

UHF IF ALIGNMENT

Connect bias as under "Oscillator Alignment".
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Direct	UHF input jack.	43.5MC (10MC Swp)	43.5MC	UHF	Vert. amp. thru 10K to point (A). Low side to chassis.	A29	Adjust for flat response.

ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Remove 6DE6 (V3) from its socket.
Connect two matched 100KΩ (± 1%) resistors in series from point Ⓒ to chassis. The junction of these two resistors is alignment point Ⓓ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
14.	2200Ω carbon resistors	High side thru 2200Ω resistor to point Ⓐ. Low side to chassis.	4.5MC (400∿ 30% Mod)	Any non-interfering channel.	DC probe to point Ⓒ. Common to chassis.	A30, A32	Adjust for maximum indication on scope.
15.	"	"	"	"	DC probe to point Ⓔ. Common to point Ⓓ.	A31	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V3 in its socket.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove 6DE6 (V3) from its socket.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	2200Ω carbon resistor	High side thru 2200Ω resistor to point Ⓐ. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point Ⓒ. Low side to chassis.	A30, A32	Disconnect stabilizing capacitor (C3). Adjust for curve of maximum amplitude and symmetry similar to Fig. 5.
15.	"	"	"	"	"	Vert. amp. to point Ⓔ. Low side to chassis.	A31	Reconnect C3. Adjust A31 so that 4.5MC marker occurs at center of crossover lines as in Fig. 6. SLIGHTLY retouch A32 for maximum amplitude and straightness of crossover lines. Replace V3 in its socket.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
16.	2200Ω carbon resistor	High side thru 2200Ω resistor to point Ⓑ. Low side to chassis.	4.5MC (400∿ 30% Mod)	Any	Positive lead thru crystal probe to pin 2 (grid) of picture tube. Common to chassis.	A33	Adjust for MINIMUM indication on scope.

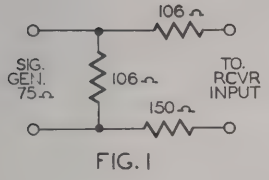


FIG. 1

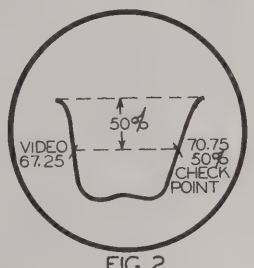


FIG. 2

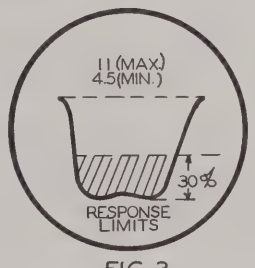


FIG. 3

FIG. 5

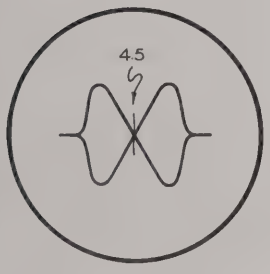


FIG. 6

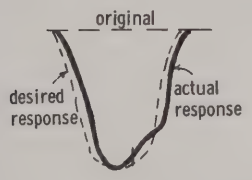


FIG. 4A

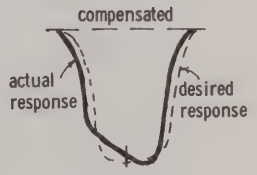
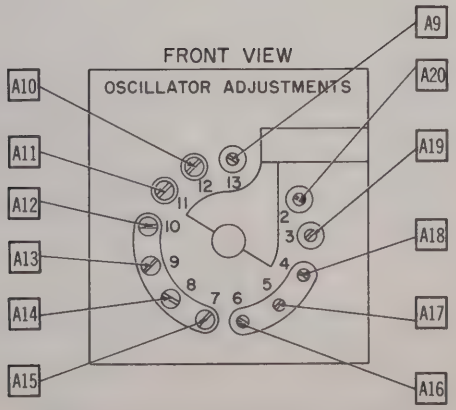


FIG. 4B

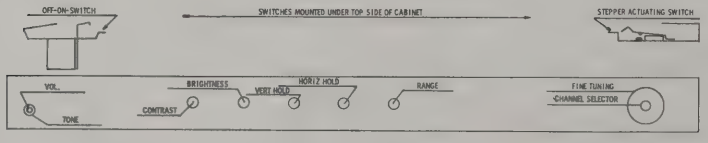


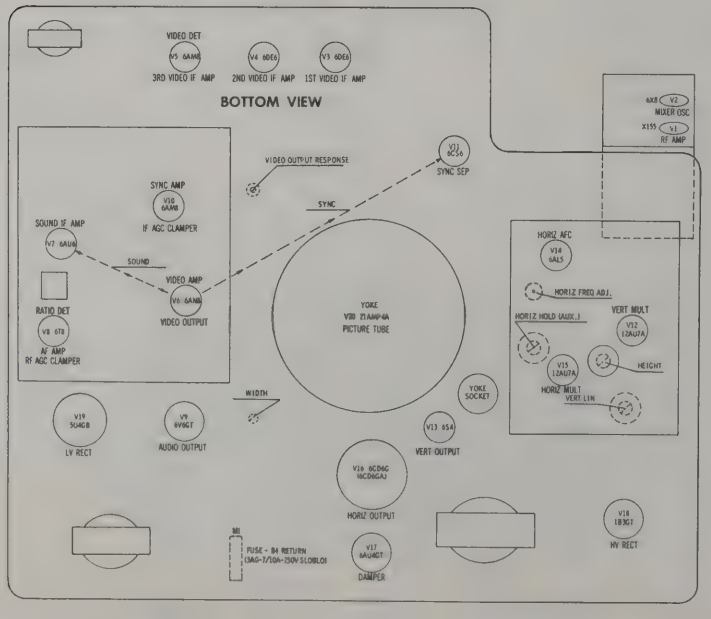
PHILCO MODELS 22D4148, L, 22D4162, L, 22D4163M, 22D4164 (Ch. TV-440)

RESISTANCE MEASUREMENTS

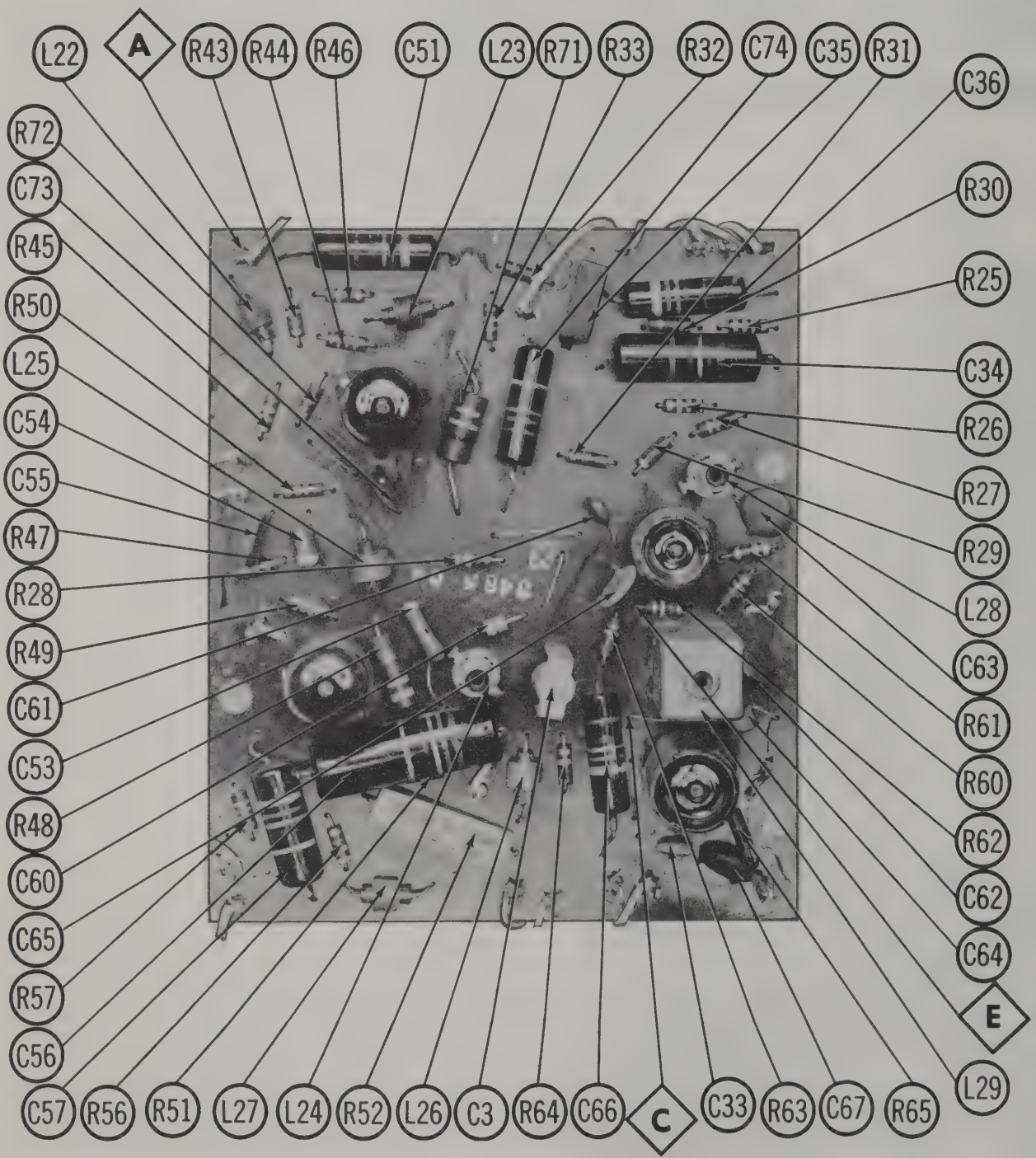
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	X155	†1800Ω	220K	INF	.1Ω	0Ω	INF	1.5Meg	0Ω	0Ω
V2	6X8	0Ω	22K	†45K	0Ω	.1Ω	0Ω	100K	†12K	†12K
V3	6DE6	350K	47Ω	0Ω	.1Ω	†2800Ω	†2800Ω	0Ω		
V4	6DE6	350K	68Ω	0Ω	.1Ω	†2500Ω	†2500Ω	0Ω		
V5	6AM8	220Ω	.1Ω	†3200Ω	.1Ω	0Ω	†3200Ω	.1Ω	3900Ω	0Ω
V6	6AN8	†7000Ω	850K	820Ω	.1Ω	0Ω	†5500Ω	†7000Ω	1Meg	●500Ω
V7	6AU6	4.4Ω	0Ω	.1Ω	0Ω	†30K	†30K	330Ω		
V8	6T8	INF	22K	INF	0Ω	.1Ω	1.5Meg	0Ω	10Meg	▲320K
V9	6V6GT	TP	.1Ω	†1100Ω	†700Ω	470K	NC	0Ω	680Ω	
V10	6AM8	270Ω	1Meg	†2200Ω	0Ω	.1Ω	†10K	0Ω	350K	0Ω
V11	6CS6	0Ω	0Ω	0Ω	.1Ω	†35K	†10K	800K		
V12	12AU7A	▲220K	1Meg	680Ω	0Ω	0Ω	●▲1.5meg	●2.5Meg	680Ω	.1Ω
V13	6S4	NC	560Ω	●1.8Meg	0Ω	.1Ω	●1.8Meg	NC	NC	▲9000Ω
V14	6AL5	470K	1.5Meg	0Ω	.1Ω	470K	0Ω	0Ω		
V15	12AU7A	†50K	●90K	1200Ω	0Ω	0Ω	†20K	5Meg	1200Ω	.1Ω
V16	6CD6G	NC	0Ω	0Ω	NC	700K	NC	.1Ω	†●6000Ω	TOP CAP ▲40Ω
V17	6AU4GT	NC	NC	60K	NC	†45Ω	NC	.1Ω	0Ω	
V18	1B3GT	PINS 1 - 8 HAVE INFINITE RESISTANCE								TOP CAP ▲710Ω
V19	5U4GB	NC	12K	NC	24Ω	NC	23Ω	NC	12K	
V20	21AMP4A	0Ω	470K	Pin 10 ▲8200Ω	Pin 11 †●160K	Pin 12 .1Ω				

† MEASURED FROM PIN 2 OF V19.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 3 OF V17.
TP TIE POINT
NC NO CONNECTION

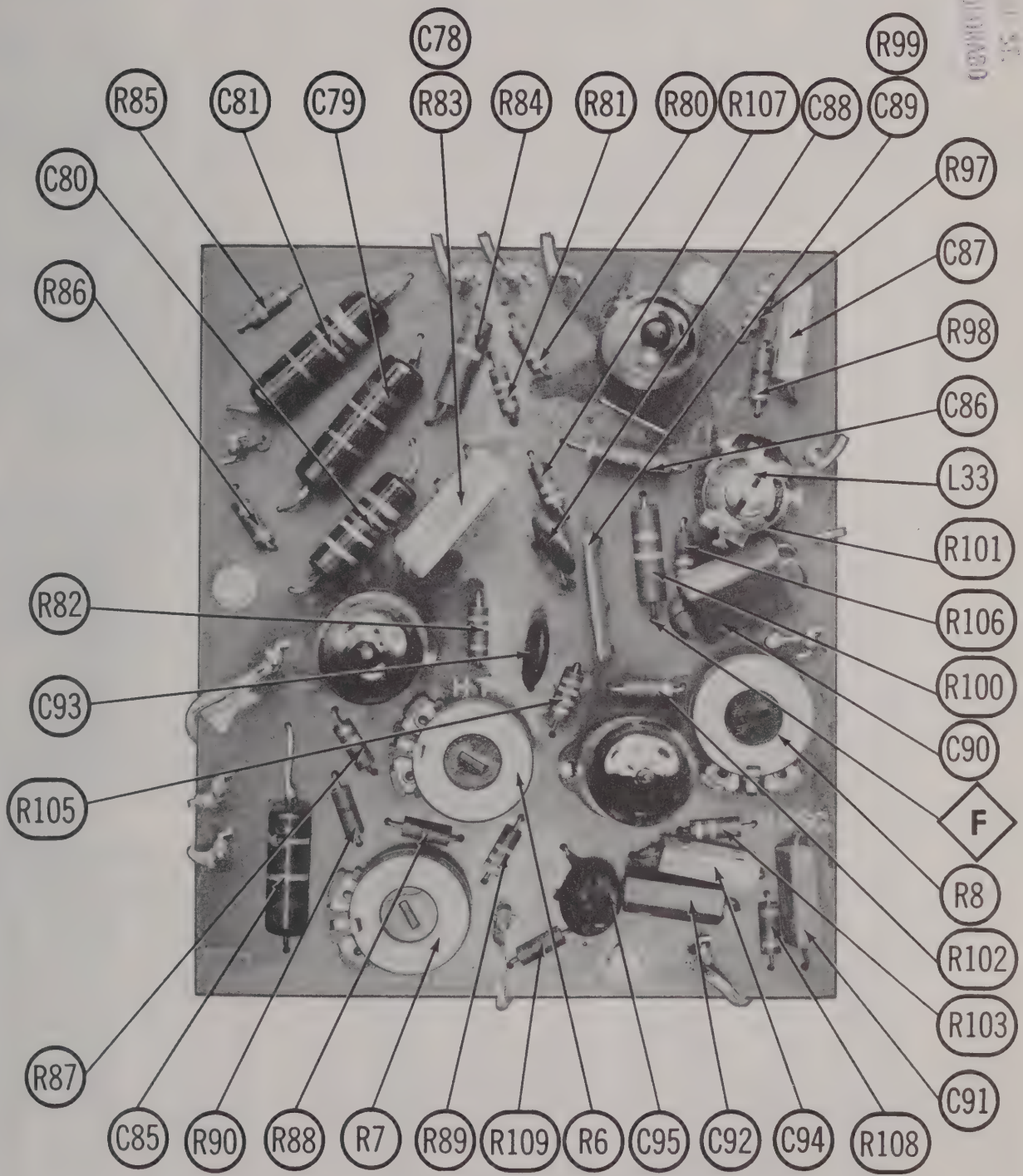




TUBE PLACEMENT CHART



VIDEO OUTPUT & SOUND IF PRINTED CIRCUIT



VERTICAL & HORIZONTAL SWEEP PRINTED CIRCUIT

SET 332 FOLDER 10

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	X155	
V2	Mixer-Oscillator	6X8	
V3	1st Video IF Amplifier	6DE6	
V4	2nd Video IF Amplifier	4DE6	
V5	3rd Video IF Amplifier		
V6	Video Detector	6AN8	
HH	Video Amplifier- Video Output	6AN8	
V7	Sound IF Amplifier	6AU6	
V8	Ratio Det -AF Amplifier RF AGC Clamper	6T8	
HH	Audio Output	6V6GT	

ITEM No	USE	TYPE	NOTES
V10	Sync Amplifier- IF AGC Clamper	6AM8	
V11	Sync Separator	6C8S	
V12	Vert Mult -	12AUTA	
V13	Vert Output	6S4	
V14	Horiz AFC	6AL5	
V15	Horiz Mult	12AUTA	
V16	Horiz Output	6CD8G	Note 1
V17	Damper	6AU4GT	
V18	HV Rectifier	1B3GT	
V19	LV Rectifier	5U4GB	

Note 1. 6CD8GA may be used in some receivers.

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	PHILCO PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V20	21AMP4A	21AMP4A	21AMP4A	21AMP4A	Aluminized Silver screen "B5"
		21ACP4	21AMP4	21AMP4	

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP.	RATING VOLT	PHILCO PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	400	30-3584-88	AFH-51	A048	FP166	TMH-51	S-370	TVL-1725
C1A	▲30	350	30-3584-87	AFH-56-04		FP464.3		ST-350	RS381 *
B	▲30	350		-0		TC80		MFTD-3530	
C	10	350							
D	▲40	150							
C3	2	50	30-3589	PRS50V3	BBR5-50	TC302	TD-3-50	MT-0502	TVA-1301
C3A	▲20	350	30-3590-3 (Note 1)	AFH3-107-50		WP202.1		SD-350	RS382 *
B	▲50	25	(Note 1)			TC301		MT-4550	
C	50	25	(Note 1)						
C4	50	300	30-3611-53	PRS350Y40	BR4035	TC78	TD-40-350	FM-4540	TVA-1511

Note 1. In early production, C4 was separate items. (C4A part 30-2568-62, C4B or C4C part #45-3035-2).
* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING CAP.	RATING VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	2.7		30-1224-125							
C7	M		30-1224-9							
C8	M		30-1224-78	MPG-625	TCZ-4R7	20U	MPGA-050	Z7-555	57CCB-V47	
C9	K30		62-1230(101)	S2S30	DS-S2M	TP39	GPZK-121	S3-U33	5GA-T23	
C10	K20		30-1224-6			Z03				
C11	1000		30-1245-7							
C12A	2.7		30-1224-125							Note 2
C12B	350		30-1238-9	BPD-00035	DD-151	G046	SII-151	UC-5315	5GA-T15	
C14	5.3		31-6530-3				3115-01-0R5	C7065A		
C15	5.3		30-1245-8							
C16	350		30-1238-9	BPD-0035	DD-151	G046	SII-151	UC-5315	5GA-T15	
C17	33		62-0154(901)	MPG-S15	TCZ-15	TP35	MPGK-S50		57CC-Q15	
C18	3.3		31-6530-1	MPG-4S1.5	TCZ-3R3	TP35	MPGA-3R3		57CCB-V33	
C19	1.5		30-1224-123	MPG-4S1.5	TCZ-1R5	TP34	MPGA-1R5	Z7-555	57CCB-V15	
C20	56		62-0564(9001)	MPG-S56	TCZ-56	TP36	MPG-3/4			
C21	5.3		31-6530-3		839-3		3115-01-0R5	C7065A		
C23	1.5		30-1224-120							
C24	350		30-1238-9	BPD-00035	DD-151	G046	SII-151	UC-5315	5GA-T15	
C25	350		30-1238-9	BPD-00035	DD-151	G046	SII-151	UC-5315	5GA-T15	
C26	33		62-0153(900)							
C27	33		62-0123(901)							
C28	33		30-1224-27							
C29	10000		30-1238-3	BPD-01	DD-103	KD63	SII-01	DC-513	59EC-S1	
C30	1000		62-1690(901)	SIH10	DK-041	TP50	GPZK-481	UC-5368	5GA-T98	
C30	1000		30-1245-6							
C31	680		62-1660(901)	SIH80	D6-081	TP50	GPZK-681	UC-5368	5GA-T98	
C32	3.3	200	30-6530-48	P36N-33		TC4	CUBD323		PT6033	57M-P23
C33	470		30-1238-10	BPD-00047	DD-471	KD60	SII-471	UC-5347	5GA-T47	
C34	1	200	30-6530-47	P36N-1	DF-104	CUBD1			PT36-P1	
C35	5000	400	62-0000		D6-052	ID5DE	GPB-333-603	MC401	1F36-S5	Note 3
C36	.047	300	30-6650-45		BPD-05	DF-503	CUBD847		57M-D47	
C37	3.3		30-1224-134		MPG-S3.3	TCZ-3R3	TZ06	MPGA-3R3	Z7-5533	57CCB-V33
C38	5.3		31-6530-1			839-3				
C39	5.3		31-6530-3			839-3		3115-01-0R5	C7065A	
C40	5.7		31-6530-20			839-7				
C41	5.3		31-6530-12			839-6				
C42	1500		30-1238-15	BPD-0015	DD-152	KD71	501-0015	DC-5215	59EK-D15	
C43	680		62-1660(901)	SIH80	D6-081	TP50	GPZK-681	UC-5368	5GA-T98	
C44	1500		30-1238-15	BPD-0015	DD-152	KD71	501-0015	DC-5215	59EK-D15	
C45	680		62-1660(901)	SIH80	D6-081	TP50	GPZK-681	UC-5368	5GA-T98	
C46	47		62-0174(901)	SIT47	D6-070	TP36	GPZK-470		57CC-Q47	
C47	1500		30-1238-15	BPD-0015	DD-152	KD71	501-0015	DC-5215	59EK-D15	
C48	680		62-1660(901)	SIH80	D6-081	TP50	GPZK-681	UC-5368	5GA-T98	
C49	1500		30-1238-15	BPD-0015	DD-152	KD71	501-0015	DC-5215	59EK-D15	
C50	5		30-1224-126	BPD-05	DD-050	Z01	MPGA-050	Z7-555	57CCB-V47	
C51	.047	300	30-6650-45	BPD-05	DF-503	CUBD847		PT6147	57M-D47	
C52	470		62-1470(901)	SI470	D6-071	TP48	GPZK-471	UC-5347	5GA-T47	
C53	33		62-0654(9001)	BPD-0268	D6-030	TP36	GPZK-330		57CCB-Q68	
C54	33		62-0134(9001)	1469-00001G	TCZ-13	TZ30	MPGK-130		MB-413	
C55	10000		30-1238-3	BPD-01	DD-103	KD63	SII-01	DC-513	59EC-S1	
C56	.22	400	30-6650-49		BPD-22	DF-523	CUBD423		PT6123	57M-P23
C57	.047	400	30-6650-45		BPD-05	DF-503	CUBD847		PT6147	57M-D47
C58	.022	600	30-6650-50		BPD-02	DF-503	CUBD823	SIT-02	PT6123	57M-D22
C59	.047	400	30-6650-45		BPD-05	DF-503	CUBD847		PT6147	57M-D47
C60	5		30-1224-34							
C61	9		30-1251-10			Z01S	MPGA-9R3			
C62	3000		30-1238-13		BPD-002	DD-302	KD72	501-002	DC-533	59EK-D2
C63	5000		30-1238-1		BPD-005	DD-502	KD80	SII-005	DC-535	59EK-D5
C64	330		30-1238-21		BPD-00033	DD-331	TP43	SII-331	DC-5333	59EK-D33
C65	1500		30-1238-15		BPD-0015	DD-152	KD71	501-0015	DC-5215	59EK-D15
C66	.047	300	30-6650-45		BPD-05	DF-503	CUBD847		PT6147	57M-D47
C67	10000		30-1238-3		BPD-01	DD-103	KD63	SII-01	DC-513	59EC-S1
C68	5000	300	30-1238-1		BPD-005	DD-502	KD80	SII-005	DC-535	59EK-D5
C69	.047	300	30-6650-45		BPD-05	DF-503	CUBD847		PT6147	57M-D47
C70	.0033	600	30-6650-44		BPD-00033	DF-502	CUBD833	GPB-333-333	PT6333	57M-D33
C71	.015	1000	30-6650-48		P10GN-015	DDH-153	CUBD815		PT6315	57M-D15

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C72	.047	300	30-6650-45	BPD-05	DF-503	CUBD847		PT6147	57M-D47	
C73	10000		30-1238-3	BPD-01	DD-103	KD63	SII-01	DC-513	59EC-S1	
C74	.022	600	30-6650-45	BPD-02	DD-303	CUBD823	SIT-02	PT6123	57M-D22	
C75	680		62-1660(901)	SIH80	D6-081	TP50	GPZK-681	UC-5368	5GA-T98	Note 4
C76	100		62-1000(901)	SI100	D6-101	TP34	GPZK-101	UC-531	5GA-T1	
C77		300	30-6650-47	P36N-1	DF-104	CUBD1		PT601	57M-P1	
C78A	4000									
B	10000		130-6008-1	T2A-367-3						
C	10000									
C79	.01	600	30-6650-58	BPD-01	D6-103	CUBD801	GPB-333-103	PT601	67M-S1	
C80	.0033	400	30-6650-55	1404-0033		1N5D33			MB-333	
C81	.047	300	30-6650-45	BPD-05	DF-503	CUBD847		PT6147	57M-D47	
C83	.022	600								
C84	.047	400	30-6650-45	BPD-05	DF-503	CUBD847		PT6147	57M-D47	
C86	.047	600	30-6650-45	BPD-05	DF-503	CUBD847		PT6147	57M-D47	
C85	.01	400	30-6650-51	BPD-01	D6-103	CUB401	GPZ-333-103	PT601	67M-S1	
C86	68		62-0684(901)	NPO-S68	D6-680	TC26	NPO-337-680		57CC-Q68	
C87	120	500	30-1125(3)27	1469-00002	TCZ-12D	ZDR5T13	SII-131		MB-413	
C88	1000		30-1238-3	BPD-001	DD-103	KD63	SII-01	DC-531	59EK-S1	
C89A	1000		630-0009-3		4PA-366-3					
B	14000									
C90	2500	500	30-3223(6)34	1404-0022			1R5D22		MB-322	
C91	82	500	30-0082(9)67	1468-0000S2	TCZ-S2		22R5Q82	SII-S20	MB-433	
C92	500	500	30-0335(4)17		D6-S1		5R5T39	SII-391	MB-339	
C93	1000		30-1238-3	BPD-001	DD-102	KD69	501-001	DC-521	59EK-D1	
C94	390	500	30-1225(4)37		D6-S9		5R5T39	SII-391	MB-339	
C95	1000		30-1238-3	BPD-001	DD-103	KD69	501-001	DC-531	59EK-D1	
C96	1000		30-1238-3	BPD-001	DD-103	KD69	501-001	DC-531	59EK-D1	
C97	.033	600	30-6650-51	P68BN-S33		CUBD833		PT6133	57M-S33	
C98	.1	600	30-6650-47	P68BN-1	DF-104	CUBD1		PT601	67M-P1	
C99	82	1000	30-1245-4							
C100	1000	600	30-6650-58	BPD-01	DD-103	CUBD801	SII-01	PT601	67M-S1	
C101	10000	600	30-1238-3	BPD-01	DD-103	CUBD801	SII-01	PT601	67M-S1	
C102	100		62-1100(9)01	SI100	D6-101	TP34	GPZK-101	UC-531	5GA-T1	Note 5

† Items C78A, C78B, C78C, R83A, R83B, R83C and R83D are combined in one unit.
▲ Items C84A, C84B, R99A, R99B are combined in one unit.
Note 2. Tuner stamped Run 4 uses 3.3MMF unit in this application. Tuner stamped Run 3 uses 3.9MMF unit in this application.
Note 3. Some versions may use .01MFD unit (part #30-6650-58) in this application.
Note 4. Early versions use 330MMF unit (part #62-1330(9)01) in this application.
Note 5. Not used in some versions.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	IRC Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	5Meg	1	33-5573-13	F1-S3			UP10KL	Tone - Panel
B	250K			R1-34			UR25K-T737	Volume-Tapped at 100K-Rear
R2A	1500Ω	1	33-5573-31	AB-8	A47-1500-S	QU-109	TA15KL	Contrast - Note 1
B	Shaft		Not Req.	AK-3	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	100K	1	33-5572-31	AB-40	A47-100K-S	QU-138	TA15L	Brightness
B	Shaft		Not Req.	AK-3	FS-3	Not Req.	Not Req.	Attach to R3A
R4A	5Meg	1	33-5572-30	AB-84	A47-5Meg-S	QU-140	TA3L	Vert. Hold - Note 2
B	Shaft		Not Req.	AK-9	FS-9	Not Req.	Not Req.	Attach to R4A
R5A	500K	1	33-5572-34	AB-31	A47-500K-S	QU-133	TA54L	Horiz. Hold - Note 3
B	Shaft		Not Req.	AK-3	FS-3	Not Req.	Not Req.	Attach to R5A
R6	2.2Meg	1	33-5572-23					Vert. Linearity
R7	2.5Meg		33-5572-33					Height
R8	250K		33-5573-34					Horiz. Osc.
R9A	12.5K	2	33-5579-6		A10-15K	WPH13500	B15ML	Width-Wire-wound- Note 4
B	Shaft		Not Req.		FS2-1/4	Not Req.	Not Req.	Attach to R9A
R10	12.5K	2	33-5579-7			WPH13500	B15ML	Width-Wire-wound

† Universal Replacement (Mallory exact duplicate part #U83200)
Note 1. Some versions will use an alternate control part #33-5573-29.
Note 2. Some versions will use an alternate control part #33-5572-30.
Note 3. Some versions will use an alternate control part #33-5573-18.
Note 4. Some versions will use an alternate control part no. 33-5574.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA PHILCO Part No.	IRC Part No.	NOTES
R10	33K		66-5323(4)0	BTA-33K	
R11	470K	5%	66-4478(4)0	BTA-470K 5%	
R12	470K	5%	66-4478(4)0	BTA-470K 5%	
R15	180K		66-5183(4)0	BTA-180K	
R16	1000Ω		66-3103(4)0	BTA-1000	
R18	330Ω		66-5333(4)0	BTA-330	
R16	680Ω		66-5683(4)0	BTA-680	
R17	100K		66-4503(4)0	BTA-100K	
R18	22K		66-5223(4)0	BTA-22K	
R19	33K		66-5323(4)0	BTA-33K	
R20	12K	4	33-1363-1		
R21	12K	1	66-5123(4)0	BTA-12K	
R22	1200Ω	1	66-5123(4)0	BTA-1200	
R23	1000Ω		66-5103(4)0	BTA-1000	
R24	330Ω		66-4333(4)0	BTA-330K	
R25	330K		66-4333(4)0	BTA-330K	
R26	470K		66-4473(4)0	BTA-470K	
R27	33K		66-5323(4)0	BTA-33K	
R28	500K	5%	66-4518(4)0	BTA-500K 5%	
R29	12Meg	5%	66-5123(4)0	BTA-12Meg 5%	
R30	5.5Meg		66-5823(4)0	BTA-5.5Meg	
R31	12.5K	2	66-5023(4)0	BTA-12.5K 2%	
R32	1Meg		66-5103(4)0	BTA-1Meg	
R33	680K		66-4683(4)0	BTA-680K	
R34	47K		66-4473(4)0		
R35	330Ω		66-1353(4)0	BTA-330	
R36	47Ω		66-4473(4)0	BTA-47	
R37	1000Ω		66-2103(4)0	BTA-1000	
R38	18K		66-3183(4)0		
R39	330Ω		66-1353(4)0	BTA-330	
R40	68Ω		66-0683(4)0	BTA-68	
R41	100Ω		66-1103(4)0	BTA-100	
R42	330Ω		66-1353(4)0	BTA-330	
R43	390Ω		66-2393(4)0	BTA-390	
R44	470K		66-4473(4)0	BTA-470K	
R45	27K		66-3273(4)0	BTA-27K	
R46	3900Ω		66-5393(4)0	BTA-3900	
R47	1Meg		66-5103(4)0	BTA-1Meg	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA PHILCO Part No.	IRC Part No.	NOTES
R48	3300Ω	5%	66-3343(4)0	BTA-3300 5%	
R49	47K		66-3473(4)0	BTA-47K	
R50	5600Ω		66-5563(4)0	BTA-5600	
R51	680K		66-4683(4)0	BTA-680K	
R52	700Ω	7	33-1335-136		
R53	820Ω		66-5823(4)0	BTA-820	Note 1
R54	150Ω		66-1153(4)0	BTA-150	
R55	2200Ω		66-2223(4)0	BTA-2200	Note 2
R56	4700Ω		66-2473(4)0	BTA-4700	
R57	470K		66-4473(4)0	BTA-470K	
R58	220K		66-2243(4)0	BTA-220K	
R59	120K		66-4123(4)0	BTA-120K	
R60	27K		66-2273(4)0	BTA-27K	
R61	330Ω		66-1353(4)0	BTA-330	
R62	39Ω		66-3393(4)0	BTA-39	
R63	22K		66-3223(4)0	BTA-22K	
R64	22K		66-2223(4)0	BTA-22K	
R65	10K		66-6103(4)0	BTA-10Meg	
R66	6800Ω		66-2683(4)0	BTA-6800	
R67	330K		66-4333(4)0	BTA-330K	
R68	470K		66-4473(4)0	BTA-470K	
R69	680Ω	2	66-1683(4)0	BTA-680	
R70	680Ω	1	66-1683(4)0	BTA-680	
R71	10K	3	66-3103(4)0	BTA-10K	
R72	270Ω		66-1273(4)0	BTA-270	
R73	330K		66-4333(4)0	BTA-330K	Note 3
R74	1.5Meg		66-5153(4)0	BTA-1.5Meg	
R75	10K		66-3103(4)0	BTA-10K	
R76	12K	2	66-5123(4)0	BTA-12K	
R77	8200Ω		66-5823(4)0	BTA-8200	
R78	330K		66-4333(4)0	BTA-330K	
R79	390K		66-4393(4)0	BTA-390K	
R80	220K		66-4223(4)0	BTA-220K	
R81	27K		66-2273(4)0	BTA-27K	
R82	3900Ω		66-5393(4)0	BTA-3900	
R83A	10K			BTA-10K	
B	10K			BTA-10K	
C	10K		130-6008-1	BTA-10K	
D	1Meg			BTA-1Meg	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA PHILCO Part No.	IRC Part No.	NOTES
R101	68K		66-3683(4)0		
R102	120Ω		66-1203(4)0		
R103	56K		66-3563(4)0		
R104	39K		66-3393(4)0		Note 5
R105	39K		66-3393(4)0		
R106	10K		66-3103(4)0		
R107	4700Ω		66-3473(4)0		
R108	3300Ω		66-3333(4)0		
R109	1Meg		66-5103(4)0		
R110	5000Ω	7	33-1335-95	PW7-5000	
R111	68K		66-3683(4)0	BTB-68K	
R112	8200Ω	7	33-1335-118	PW7-8200	
R113	150K		66-4154(4)0	BTA-150K	
R114	180K		66-4154(4)0	BTA-150K	
R115	100K		66-4103(4)0	BTB-100K	
R116	6800Ω		66-2683(4)0	BTB-6800	
R117	2.5Ω		66-9295(4)0	BW1 3.5	
R118	2200Ω	7	33-1335-47	1 3/4-2250	
R119	470K		66-4103(4)0	BTB-470K	Note 6
R100	15K		66-5153(4)0		

† Items R83A, R83B, R83C, R83D, C78A, C78B and C78C are combined in one unit.
▲ Items R99A, R99B, C84A, C84B are combined in one unit.
Note 1: Chassis marked run 1 use a 1000Ω resistor in this application.
Note 2: Not used in chassis marked run 3 or higher.
Note 2: Chassis marked run 1 use a 150K resistor in this application.
Note 4: Special "thermistor" type.
Note 5: Not used in some versions. Also some other versions use a 82K resistor in this application.
Note 6: Some versions use a 180K resistor in this application.

TRANSFORMER (POWER)

ITEM No.	USE	REPLACEMENT DATA PHILCO Part No.	Halldorson Part No.	Merit Part No.	RCA Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
	PRI. SEC. 1 SEC. 2 SEC. 3							
T1	117VAC 550VCT 5V 12.6VCT 1.6 A 2.9A 6.3A*							

*6.3A with 12V tuner motor selector operating.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA PHILCO Part No.	Halldorson Part No.	Merit Part No.	RCA Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
T2	Horiz. Output Trans.	32-8709-1	PB41(Pⁱ)	HVO-38*	32S71(Pⁱ)	X094*	A-8253*	FLY-18*
T3	Vert. Output Trans.	32-8704	21900					A-19X
T4A	Yoke(90°Horiz&22MHz)	33-9589-1						Y-15
B	Vert(48MH)							

① Drill new mounting hole(s).
② Connect as auto trans.
Use 12.5 to 1 horiz ratio.
③ Includes resistors R95 and R96.
Use original core clamp.
④ Use original yoke damping network if necessary.
⑤ Connect horiz. damping capacitor across terms #3 & #7, then connect horiz. yoke term #3 to yoke plug pin #5. Horiz. yoke term #8 or #7 to yoke plug pin #3; horiz. yoke term #1 to yoke plug pin #8.

▼HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original With Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
3	9	9	9	9	9	9
11	7	7	7	7	7	7
2	7	7	7	7	7	7
6	N.C. See Note ②	N.C. See Note ②	N.C. See Note ②	N.C. See Note ②	N.C. See Note ②	N.C. See Note ②
8	1	1	1	1	1	1
Special Notes	① ②	① ②	② ③	② ③	② ③	② ③

① If necessary to reduce yoke "ringing", connect 300Ω 1W in series with capacitor C95.
② If necessary to increase width, add capacity (approx. 0.0068MFD) 1KV ("deltamax") across horiz. yoke terms #1 and #3

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI	IMPEDANCE SEC	PHILCO PART No.	Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	NOTES
T5	4.9K	3-4Ω	32-8683-1						

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C.	IMP.	PHILCO PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	6"	PM	6-8Ω	8Ω	34-1651-18 ①	8AR128	20S64	① Used in models 22D4182, 22D4182L, 22D4183M and 22D4184.
SP2	6"	PM	6-8Ω	8Ω	34-1663-3 ②	6AL26		② Used in models 22D4148 and 22D4148L.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	Ant. Matching Trans.	.6Ω	6Ω					
B	Ant. Matching	.6Ω	.6Ω					
C	IF Trap	0Ω						Complete assy. part #76-9925.
L2	Ant. Coils	0Ω		32-8046				
L3	Fil. Choke	0Ω		32-4623-96				
L4	Fil. Choke	0Ω		32-4623-79				
L5	Neut. Coil	0Ω		32-4652-20				
L6	Fil Coils	0Ω		32-8046				
L7	Mixer Grid Coils	0Ω		32-8045				

PHILCO MODELS 22D4148, L, 22D4162, L, 22D4163M, 22D4164 (Ch. TV-440)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L8	Osc. Coils	0Ω		328-0047				
L9	RF Choke	0Ω		32-4652-19				
L10	Conv. Plate	.1Ω		32-4629-2				Tapped
L11	47.25MC trap	.1Ω		32-4645-3	19-1002		4606	2.44 Microhenries
L12	47.25MC trap	.3Ω		32-4645-1				2.7 Microhenries
L13	41.25MC trap	0Ω		32-4645-4	19-1000		4602	1.16 Microhenries
L14	1st Video IF	.4Ω		32-4645	19-1003		4608	3.7 Microhenries
L15	RF Coil	.1Ω		32-4645-2				1.85 Microhenries
L16	Fil. Choke	.1Ω		32-4112-49				3 Microhenries
L17	2nd Video IF	.1Ω	.1Ω	32-4644				
L18	3rd Video IF	.1Ω	.1Ω	32-4644-1				
L19	4th Video IF	.1Ω	.1Ω	32-4644-2				
L20	Series Peaking Coil	2.3Ω		32-4674	19-6022		6152	22 Microhenries
L21	Series Peaking Coil	1Ω		32-4112-56				7.2 Microhenries
L22	Shunt Peaking Coil	3.7Ω		32-4653-5	19-3160		6120	150 Microhenries
L23	Series Peaking Coil	4Ω		32-4653-4	19-3100	TV-181	6177	100 Microhenries
L24	4.5MC Trap	2Ω		32-4644-3				
L25	Shunt Peaking Coil	8Ω		32-4653-6				220 Microhenries
L26	Shunt Peaking Coil	6.5Ω		32-4653-1	19-3180	TV-184	6180	180 Microhenries
L27	Series Peaking Coil	6.5Ω		32-4653-1	19-3180	TV-184	6180	180 Microhenries
L28	Sound IF	4.4Ω		32-4644-4				
L29	Ratio Det.	8.2Ω	2ΩCT	32-4673	17-3499			Tertiary winding=1.2Ω
L30	RF Choke	2Ω		32-4112-50	19-1006		4624	15 Microhenries
L31	RF Choke	2Ω		32-4112-50	19-1006		4624	15 Microhenries; Wound on 15Ω 1W resistor
L32	RF Choke	2Ω		32-4112-50	19-1006		4624	15 Microhenries

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L33	180Ω		32-4672-1							

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L34	.290A	41Ω	1.3HY	32-8710	C5037 ①			26C44	C-23X

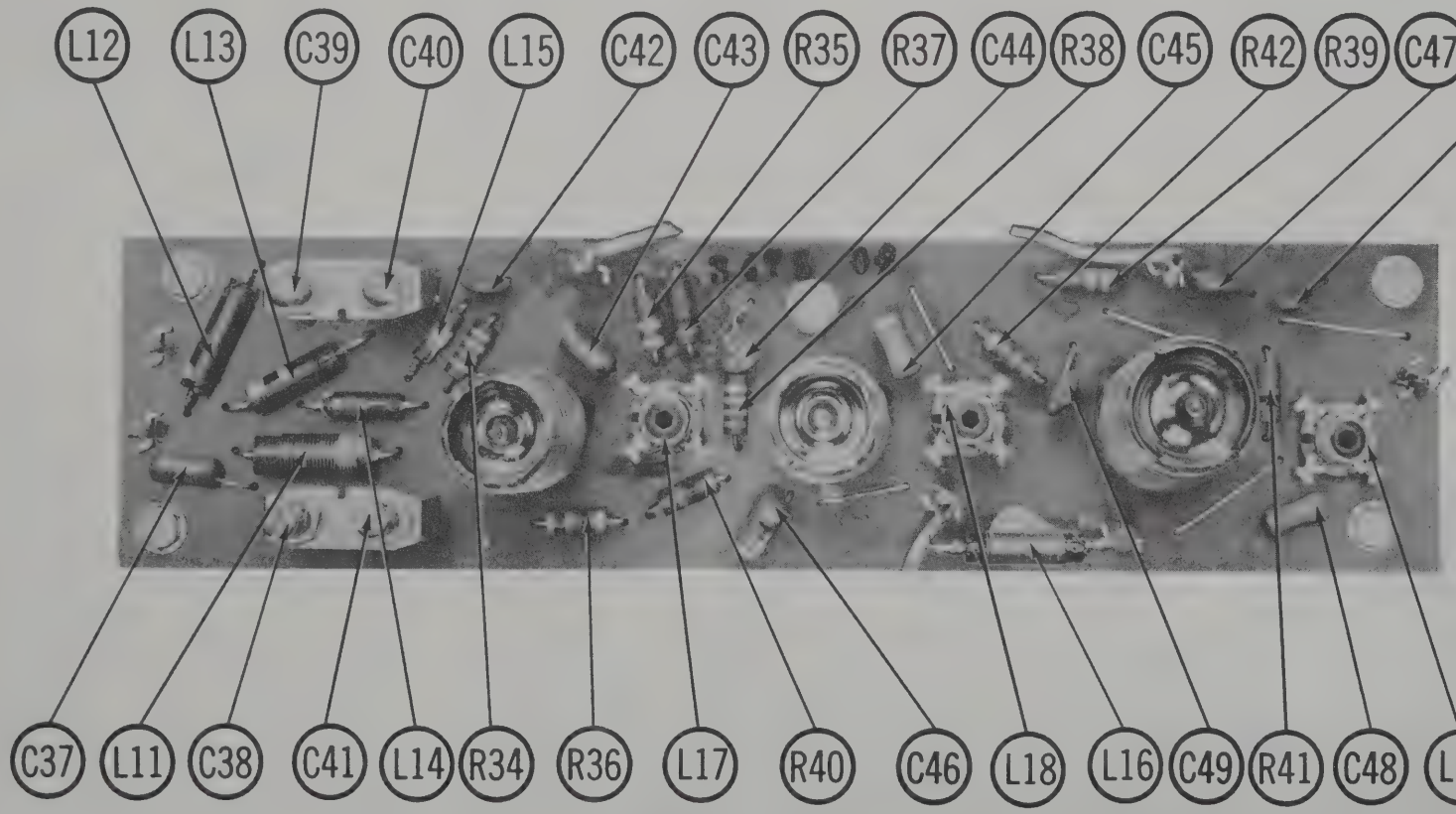
① Drill one new mounting hole.

FUSES

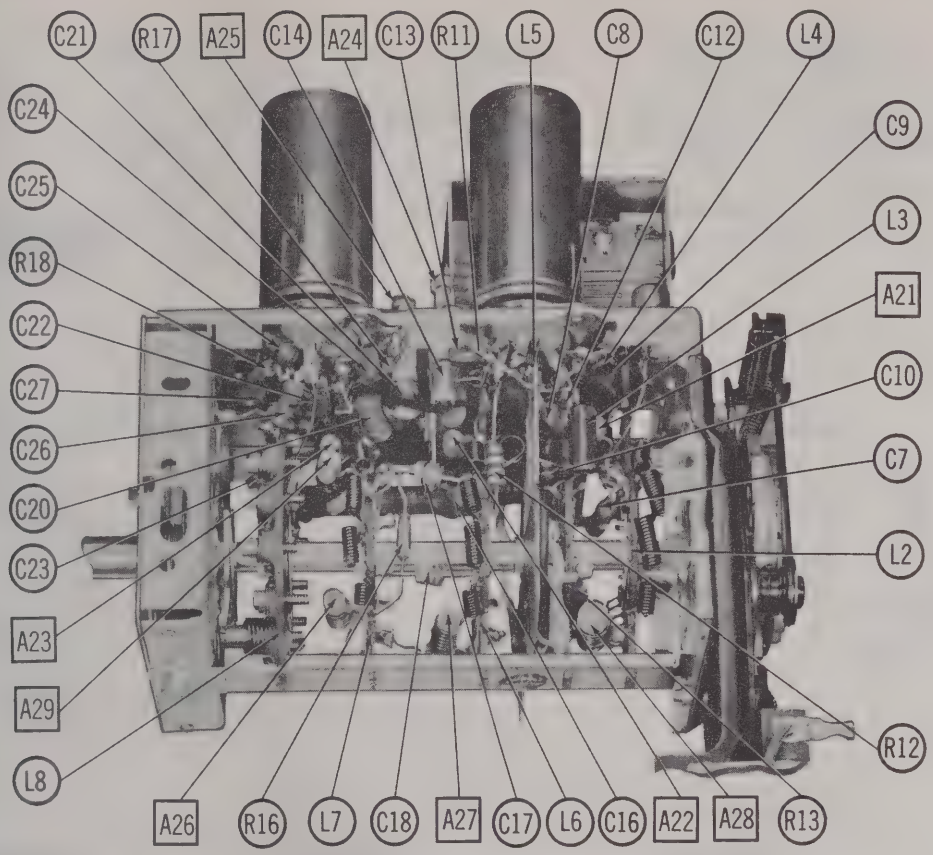
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PHILCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	7/10A 250V	AD-2246-15		313.750 (3AG-S/B-3/4A)	357001	MDL 7/10	4405
M2	1" piece #28 wire							
M3	1" piece #28 wire							

MISCELLANEOUS

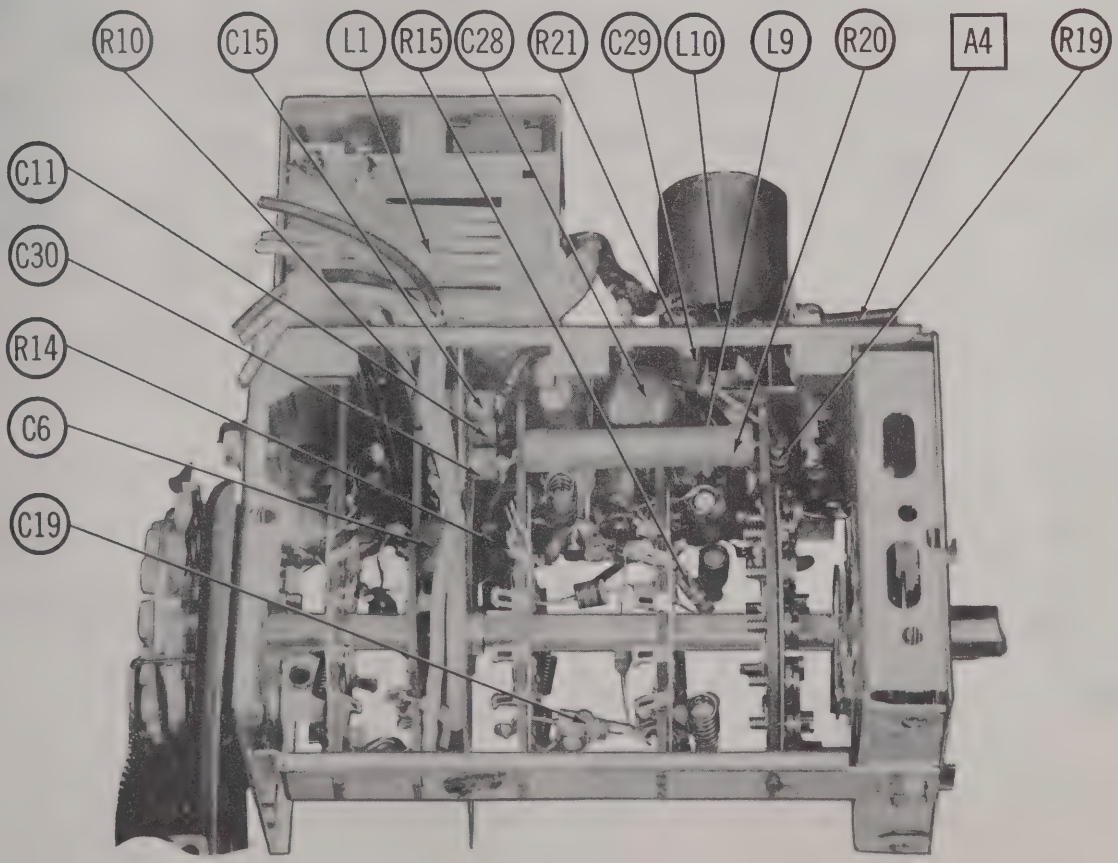
ITEM No.	PART NAME	PHILCO PART No.	NOTES
M4	Dial Light	3463-4	#1847
M5	Tuner	76-9531-1	VHF (T-62A)
M6	Switch	42-2035-1	Range (Rotary, Wafer Type)
M7	Switch	76-9747	On-Off (Power) SPST
M8	Switch	76-9739-1	Stepper Actuating (Micro Type)
M9	Switch	42-2051-1	"Hold" - Stepper Unit
M10	Motor	41-2055	Stepper Unit Drive
M11	Focus Magnet	76-9511-2	Includes Centering Device
M12	Ion Trap	76-6077-2	
	Trimmer Cap.	31-6473-34	Video Output Response (9-120MMF)
	Cabinet	11147	Mahogany - Model 22D4162
	Cabinet	11147-1	Light - Model 22D4162L
	Cabinet	11142	Mahogany - Model 22D4164
	Cabinet	11136-1 or 11136-3	Light - Model 22D4148L
	Knob	54-6204	Brightness, Contrast, Horiz. Hold, Vert. Hold - All Models
	Knob	54-6204-1	Range Switch - All Models
	Knob	76-9728	Tone - All Models
	Knob	54-6198	Volume - All Models
	Knob	76-9722	Channel Selector - All Models
	Knob	54-6196	Fine Tuning - All Models
	Push Button	54-9591-2	On-Off (Power) - All Models
	Push Button	54-9591-3	Stepper Unit - All Models
	Mask	28-10792-6	Models 22D4162, 22D4162L
	Mask	28-10792-5	Model 22D4164
	Mask	28-10616-6	Models 22D4148, 22D4148L.
	Safety Glass	54-9213-60	Models 22D4162, 22D4162L.
	Safety Glass	54-9213-58	Model 22D4164.
	Safety Glass	54-9213-57	Models 22D4148, 22D4148L.



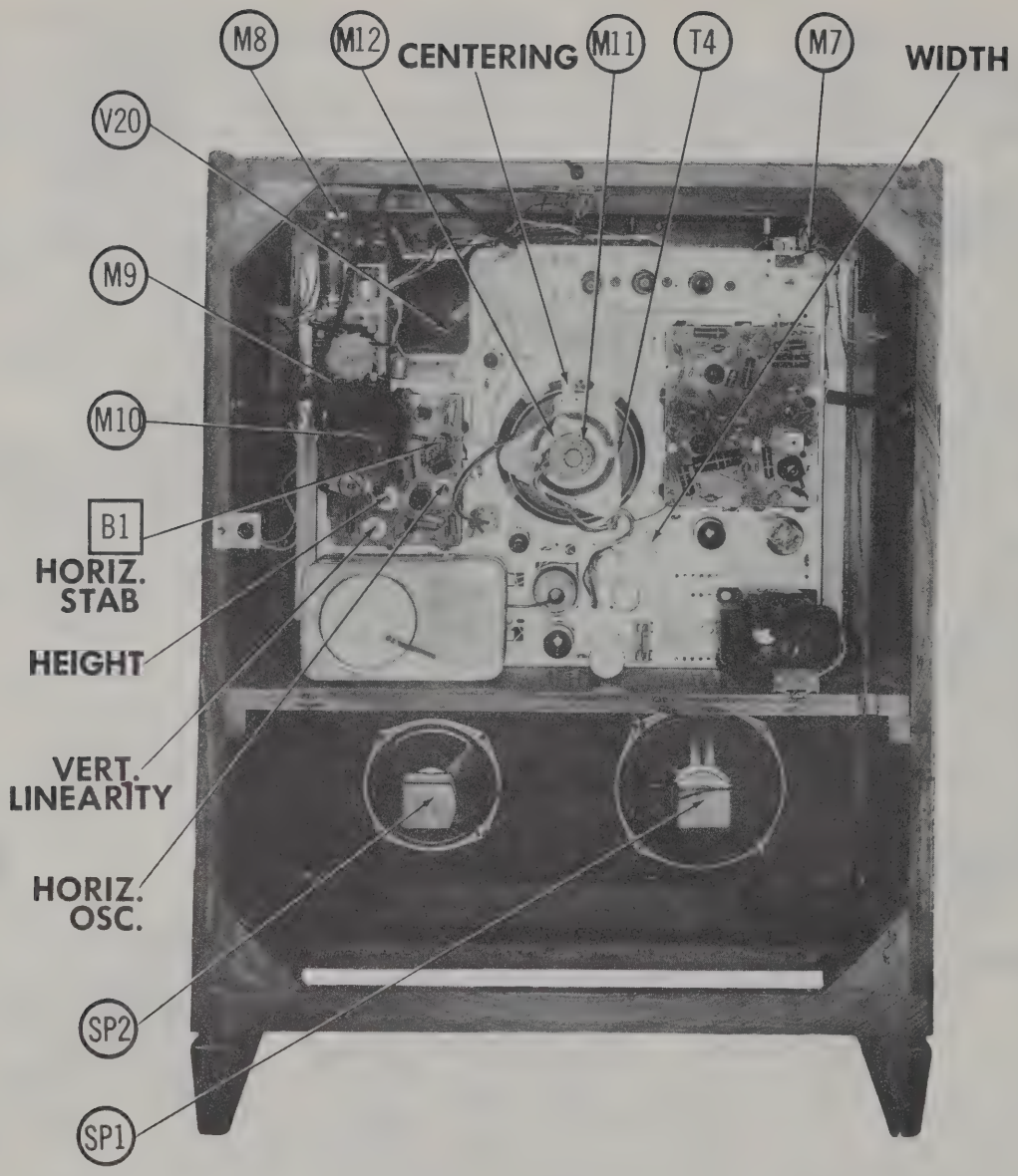
VIDEO IF PRINTED CIRCUIT



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the contrast control counter clockwise until the blanking is visible.

2. Set the horizontal hold control to the center of its range.

3. Short out the horizontal stabilizing coil (L33) by clipping a .1MFD capacitor from point (F) to chassis.

4. Adjust horizontal oscillator control (R8) until equal blanking appears on either side of the raster. This can be done by decentering the picture, first to one side and then to the other, by moving the wobble plate.

5. Remove the shorting capacitor.

6. Adjust the stabilizing slug (B1) until the picture is brought into sync with equal blanking on each side. The wobble plate is used as in step 4.

7. Check the pull-in by turning the horizontal hold control until the picture goes out of sync and then slowly bring the picture back into sync. This pull-in should occur between $2\frac{1}{2}$ to 3 bars. If pull-in is not correct, repeat the above steps. Adjust the width control for a picture slightly wider than necessary to fill the screen horizontally.

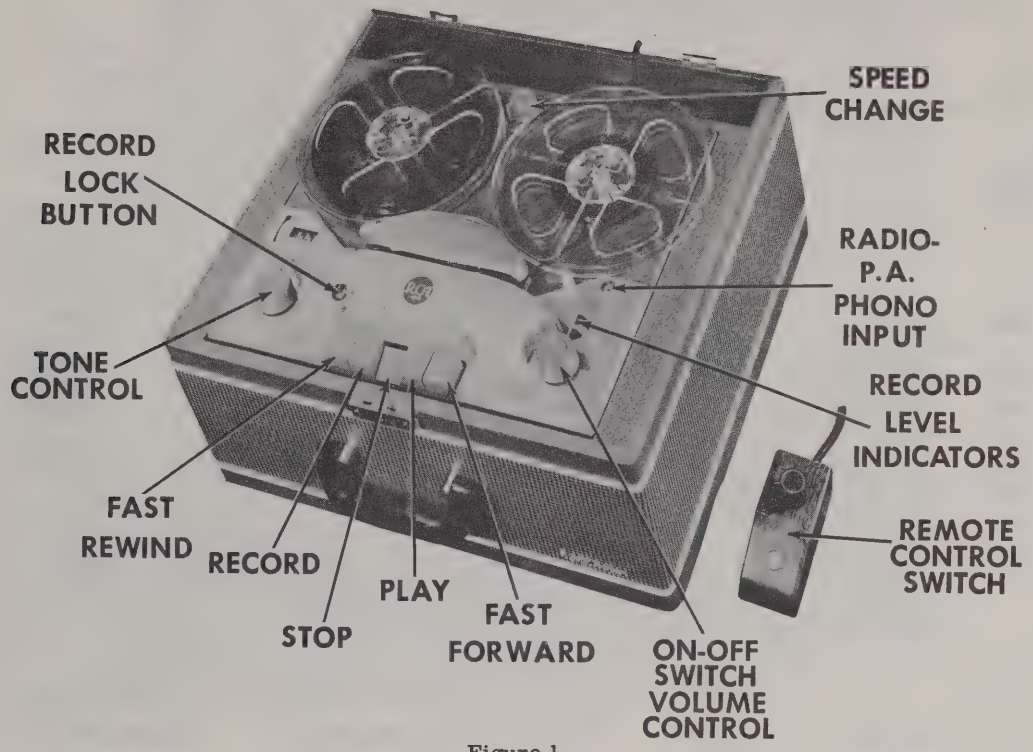


Figure 1

GENERAL INFORMATION

The RCA Models SRT-401 and SRT-402 are electrically alike. The major difference between the models is that the SRT-402 has a mechanical tape timer. Models SRT-401 and SRT-402 feature fingertip operation for Fast Forward, Playback, Stop, Record and Fast Reverse. These recorders are designed to record and play back two tracks of material on standard width recording tape. Two neon recording indicators simplify the recording level setting. New Recordings can be made on previously recorded tape since the erase head is automatically positioned when the "Record" button is pressed, or the same recording may be played back indefinitely. Recordings can be made from a radio, television receiver, or phonograph, in addition to those made directly from the microphone. Recordings can be played back through the self-contained speakers, or an external speaker may be used by connecting to the "Ext. Spkr." jack.

The RCA Models SRT-401 and SRT-402 have two tape speeds, 3 3/4" and 7 1/2" per second. Using both tracks of the tape the recording time is as follows:

Reel Size	3 3/4" Speed	7 1/2" Speed
5" (600 ft.)	1 hour	1/2 hour
7" (1200 ft.)	2 hours	1 hour

The RCA is designed to operate on 60 cycle, 115 volt, AC supply.

CAUTION: Severe Damage Will Result If Connection Is Made To A Direct Current (DC) Line.

Manufactured by:

Engineering Products Dept.
Radio Corp. Of America
Camden, N. J.

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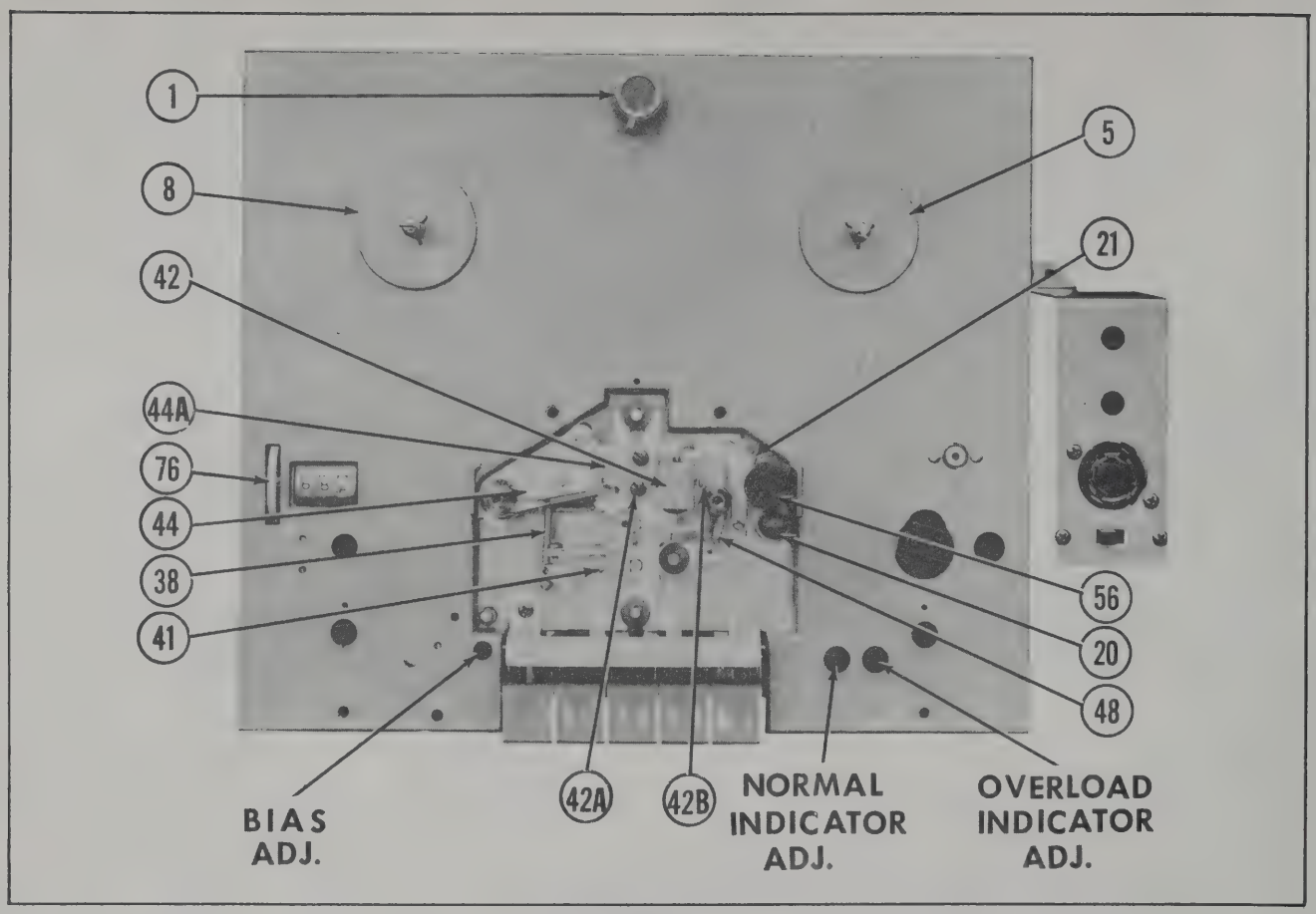


Figure 2

SPECIFICATIONS

Size: 10" x 15 7/8" x 14 1/4"
Weight: 35 lbs.
Speed: 3 3/4 and 7 1/2 IPS
Reel Capacity: Up to 7" Reel
Rewind Time: 1200' (7" Reel) in 2 3/4 min.
External Speaker Impedance: 3.2 ohms
Speakers: SRT-401 (1) Speaker, SRT-402 (2) Speakers.
Tube Complement: 5879, 12AX7, 6AQ5, 6X4
Oscillator Frequency: 60KC

OPERATING INSTRUCTIONS

Preparation For Operation-

1. Remove the AC power cord, 7" reel of tape, empty reel and the microphone from the storage compartment.

2. Depress the "Stop" button.

3. Plug the AC cord into a convenient wall receptacle of the proper rating.

4. Set speed change knob to 7.50 or 3.75 as desired.

5. Place "Remote Control" switch in "Off" position.

CAUTION: Do not turn speed change knob unless "Stop" button is depressed.

When the Forward or Reverse button are depressed, the Record and Play buttons are locked so that they cannot be pressed down, with the possibility of spilling tape. The buttons should always be pressed down firmly until they latch and the Stop button must be depressed before changing functions or speeds of the recorder.

IMPORTANT: Always depress the Stop button when the machine is not in use.

Speed Change Knob-

The arrow on the speed change knob should point at 7.50 or 3.75 according to the speed desired. These recorders have two speeds, 7 1/2" and 3 3/4" per second. The arrow pointing at 7.50 means the unit will operate at the fast speed or 7 1/2" per second.

CAUTION: Turning the speed change knob while the unit is operating will not change the speed. The Stop button must be depressed before the speed can be changed.

Threading The Tape-

1. Place a full reel of tape on the left (supply) spindle, making certain one of the reel slots catch the protrusions of the pan. Unwind about 14" of tape from the supply reel.

2. Insert free section of tape into the tape slot.

3. Insert free end of tape into one of the three slots in the hub of the right (take-up) reel and while holding the tape in place give the reel two or three turns until the tape is secured.

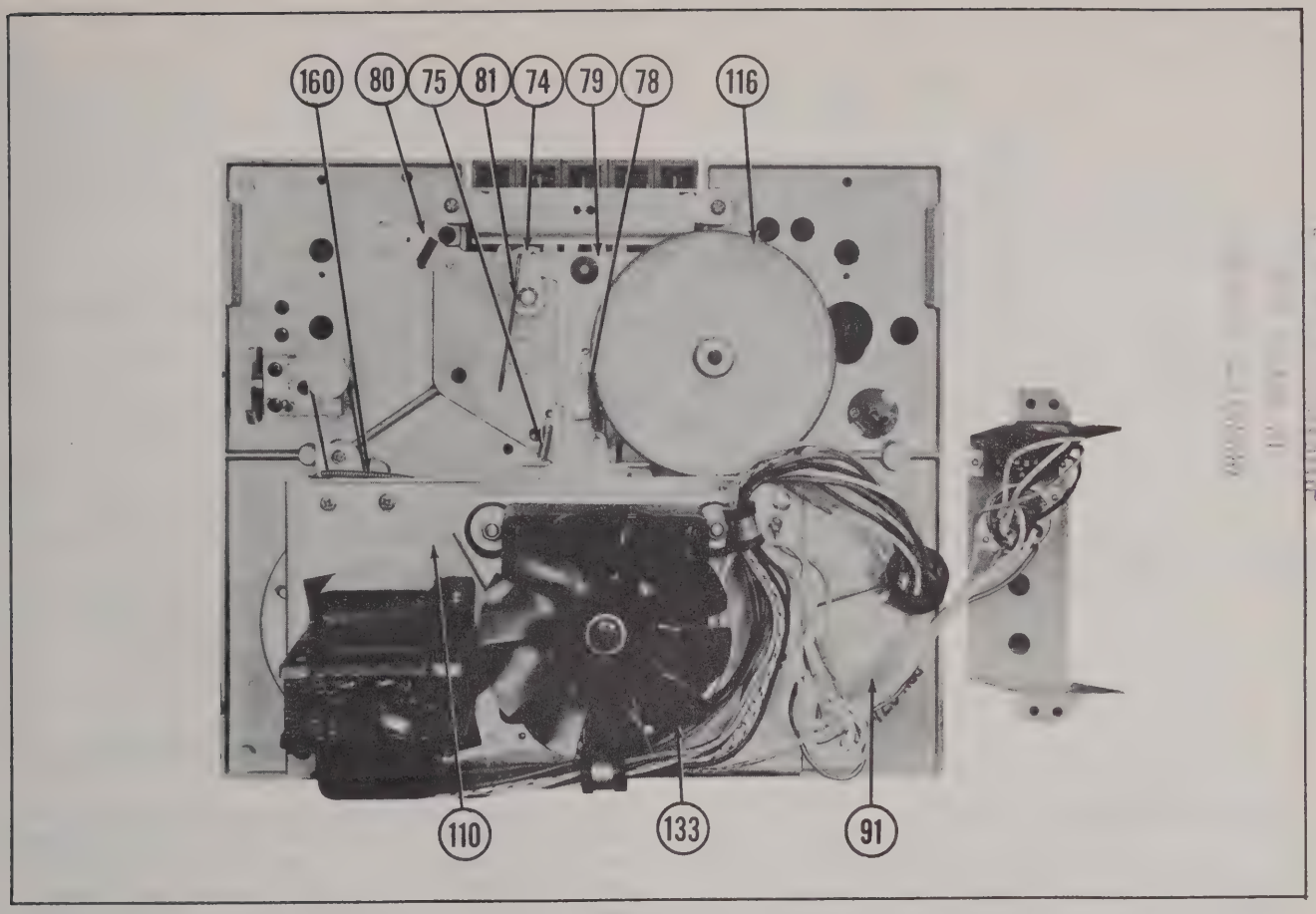


Figure 3

4. The dull side of the tape should always face away from the operator (rear of unit).

To Record From Microphone-

1. Turn the On-Off Volume control to the right until a click is heard and allow about 30 seconds for the unit to warm up. The pilot light located above the Stop Button will glow when the unit is turned on.

2. Insert the microphone plug into the "Microphone" input.

3. Move the record lock button (9) downward with the left hand. This releases the safety lock which prevents accidental erasure.

4. Depress the "Record" button with the right hand (while holding record lock button (9) with the left hand) until it latches.

5. Adjust the "Volume" control until the "Normal" indicator just flashes, while speaking into the microphone. When the "Volume" control is advanced too far the "Overload" indicator will flash and the recording will be distorted. To prevent overload, lower the "Volume" control to a point where the "Overload" indicator will not flash.

6. The "Tone" control does not operate during recording. When recording from radio, set the radio "Tone" control for maximum treble.

To Record From External Radio, TV, Or Phonograph-

1. Insert the phonograph pickup plug into the "Radio"-P.A.-"Phono" jack.

2. For radio or TV recording, connect patch cord, Part No. 204215 to the voice coil of the radio or TV receiver speaker by means of the alligator clips. Plug into "Radio-P.A.-Phono" jack.

3. Proceed as described under "To Record From Microphone".

NOTE: Remove patch cord after recording is completed.

To Use Second Track-

1. Depress the "Stop" button when all the tape has wound onto the take-up reel.

2. Remove reel containing tape and place on left-hand supply reel.

3. Place empty reel on right-hand take-up pan.

4. Thread tape as previously described.

To Play Recordings-

1. Turn on unit with "Volume" control knob.

2. Thread tape as described under "Threading The Tape".

3. Set the speed change knob (1) to the speed at which the recording was made.

4. Depress "Play" button until it latches.

5. Adjust "Volume" and "Tone" controls to desired listening level.

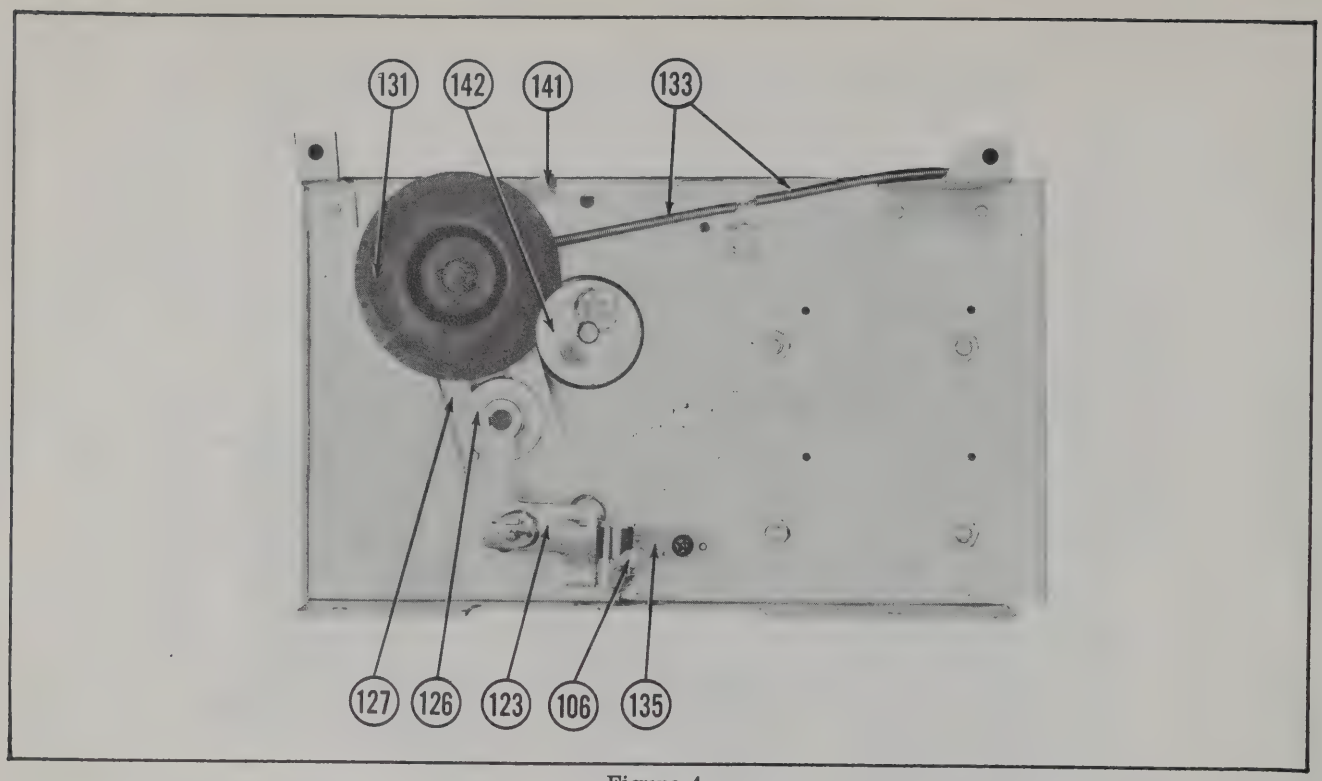


Figure 4

High-Speed Forward Or Reverse-

When it is desirable to play a certain portion of the tape over again it is not necessary to rewind the entire tape. By depressing the "Forward" or "Reverse" button the tape will advance (or reverse) at a rapid speed.

Several minutes of normal recording can be skipped in a few seconds by the "Reverse" and "Forward" buttons.

Tape Timer-

The tape timer provides complete selectivity and immediate location of any part of recorded tape. By turning the indicator to zero when beginning each reel, the numerals on the indicator will act as a ready reference to any desired portion of the recorded tape. Permanent records of this may be kept on the tape box enabling you to pin-point your favorite selections.

To Edit And Splice Tape-

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

1. The tape may be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use.

2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

Erasing Recorded Material-

When the record button is depressed, the erase head is automatically positioned, erasing any previous recording before a new one is made. You may erase material no longer needed, without recording, by depressing the "Record" button and turning the "Volume" control knob to the minimum volume position or extreme counter-clockwise position just before the recorder shuts off. One track is erased at a time. To erase the second track, reverse the reels and repeat the above operation.

To Use As A Public Address System-

Insert the microphone plug into the "Microphone" input jack. Plug in an extension speaker or speakers if desired and depress the "Record" button. Set the "Volume" and "Tone" controls to the desired listening level. A recording can be made at the same time with a tape placed on the unit in the normal manner.

CAUTION: When using the public address feature, see that the microphone is as far away from the speakers as possible, to prevent "feedback" squeal.

Remote Control Operation-

A socket and switch are provided to allow remote operation up to a distance of 15 feet, either recording or playback. This is accomplished by means of a remote control cable. Connect attachment cord as follows:

1. Insert remote control cable plug into remote socket. Be sure remote control switch on end of cable is in "Off" position.

2. With control switch on the recorder in "Off" position start the unit in the regular manner and set "Volume" control to the proper level.

3. Place control switch on the set to "On" position. Tape will come to a stop.

The recorder can now be operated (start and stop) by means of the remote cable switch. When starting the recorder by means of the remote control, the switch should be rotated to the "Motor" position and then after a slight pause rotated to the "Record-Play" position. To stop recording or playback, rotate the control switch directly to "Off" position, pausing slightly at the "Motor" position.

ADJUSTMENTS

Disassembly Instructions-

1. Remove two screws located in storage compartment.

2. Remove push-on type volume and tone control knobs.

3. Remove two screws located under volume and tone control knobs, remove front escutcheon.

4. Remove two hex head screws located under front escutcheon.

5. Remove the wood screws holding remote control panel to bottom of case.

6. Lift unit out of case, removing leads from speakers before removing unit completely.

Record-Playback Head Adjustment-
(See Exploded View)-

To adjust the record-play-head (42) for maximum frequency response, make the following adjustment:

1. Remove the rear escutcheon (12).

2. Properly thread an alignment tape or a good recorded tape on the machine.

3. Set the controls as described under "To Play Recordings".

4. To adjust for maximum output of all frequencies, loosen bracket mounting screw (42A) and rotate bracket slightly until maximum output is obtained. Tighten screws (42A) after adjustment.

To adjust for maximum high-frequency response on early production grip the vertical portion of the record/playback head mounting bracket with a pair of long-nosed pliers. Rock the mounting bracket and record head from side to side slightly until the maximum high frequencies are obtained. Bend the bracket with the pliers to obtain a permanent set at this position.

To adjust for maximum high-frequency response on late production (see figure 2) turn adjusting screw (42B) as required until the maximum high-frequency output is obtained.

Pressure Pad Adjustment-
(See Exploded View)-

1. Remove the front escutcheon (13).

2. Depress the "Play" button. Do not turn recorder on.

3. Use a pencil type postal scale and check the amount of pressure necessary to just pull the pad away from the tape. The test should be made on the end of the pressure pad mounting spring (49). Adjust the pressure pad for 1 3/4 oz. $\pm$ 1/4 oz.

Hum Control Adjustment-

It is very important for recording purposes that the hum control be correctly adjusted. Hum that is present during recording will be amplified during playback.

To set the hum control turn the unit "On" and allow the tubes to warm up, advance the volume control to approximately mid-position and adjust the hum control (R3) for minimum hum.

(a) The record head pressure pad is adjusted by the locked adjustment screw (41).

(b) The guide post pressure pad (40) is adjusted by bending the pressure pad spring. It must be adjusted for minimum pressure against the tape.

4. After the adjustments are made depress the "Stop" button and replace the front escutcheon.

Erase Head Adjustment-

1. With tape properly threaded, turn recorder on and depress the "Record" button. Allow tape to run for a few seconds then turn recorder off, but leave "Recorder" button depressed.

2. With the escutcheons removed check the erase head (44) to see if it is parallel with the tape.

3. Check to see if the top edge of the tape coincides with the top end of the diagonal slot in the erase head (junction of long diagonal slot and short vertical slot). To adjust level of tape, loosen set screw (33), see exploded view, and rotate tape guide post (34) to move tape up or down. Tighten set screw (33).

4. After this adjustment has been made, check to see if the tape moves forward approximately 1/64" when the "Record" button is depressed. If not, loosen the forward adjustment screw (44A), see Figure 2 and turn the screw in or out as required to obtain this 1/64" movement. Tighten the lock nut.

Brake Shoe Adjustment-

1. In order to adjust the brake shoes, the complete mechanism must be removed from the carrying case and the speakers disconnected.

2. With all push buttons in the up position the brake shoes (68) should clear the drums by approximately 1/8".

3. Depress the "Stop" button while observing the brake shoes. Both brake shoes must contact the drums at the same time and with equal pressure.

4. The adjustment is accomplished by bending the spring arm (67).

Adjustment For Slow Take-Up Reel-

There are some instances where the spring drive belt (21), see Figures No. 2 and No. 6A, stretches after a period of time. When this happens, the take-up

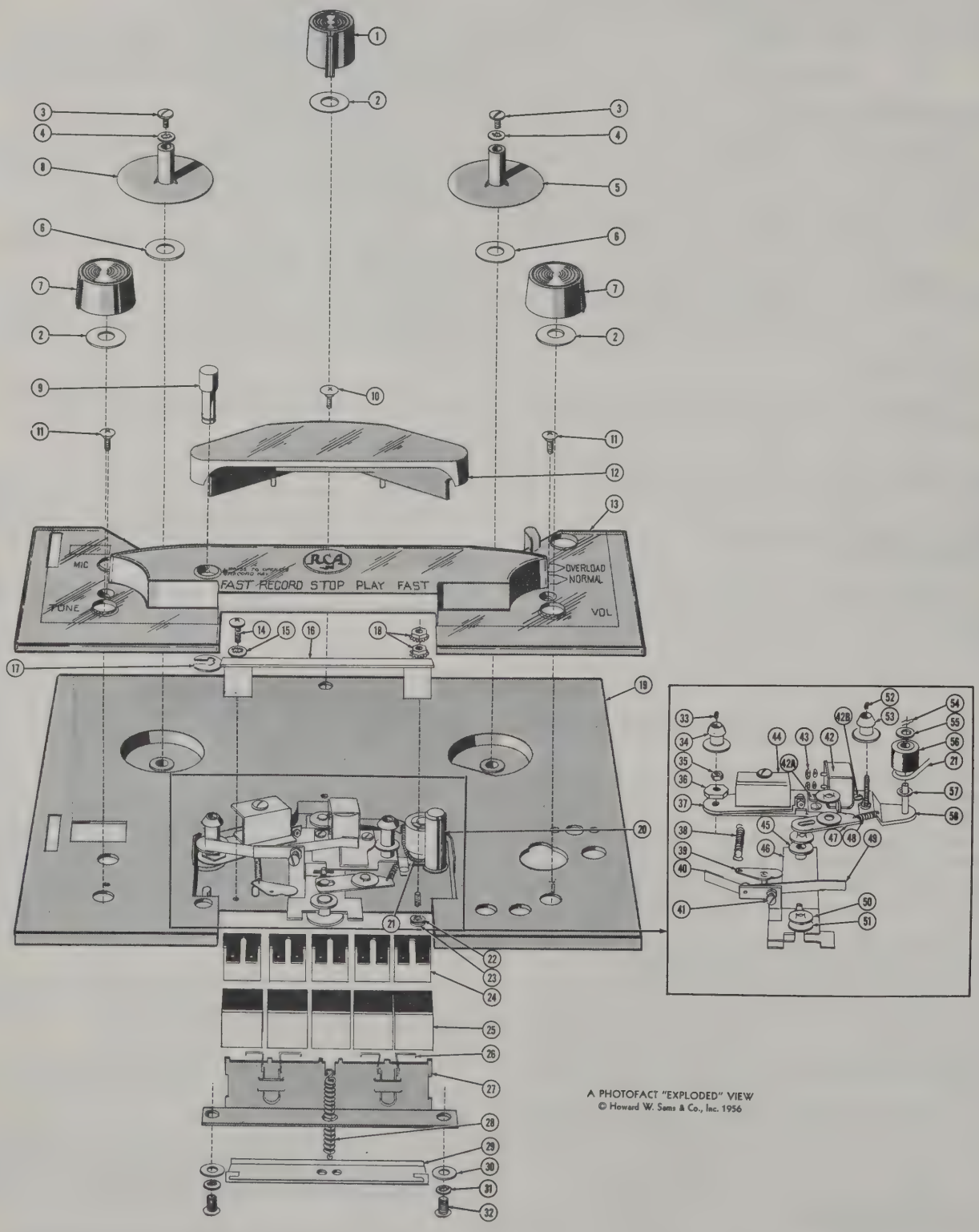


Figure 5A. Exploded View of Parts Above Baseplate.

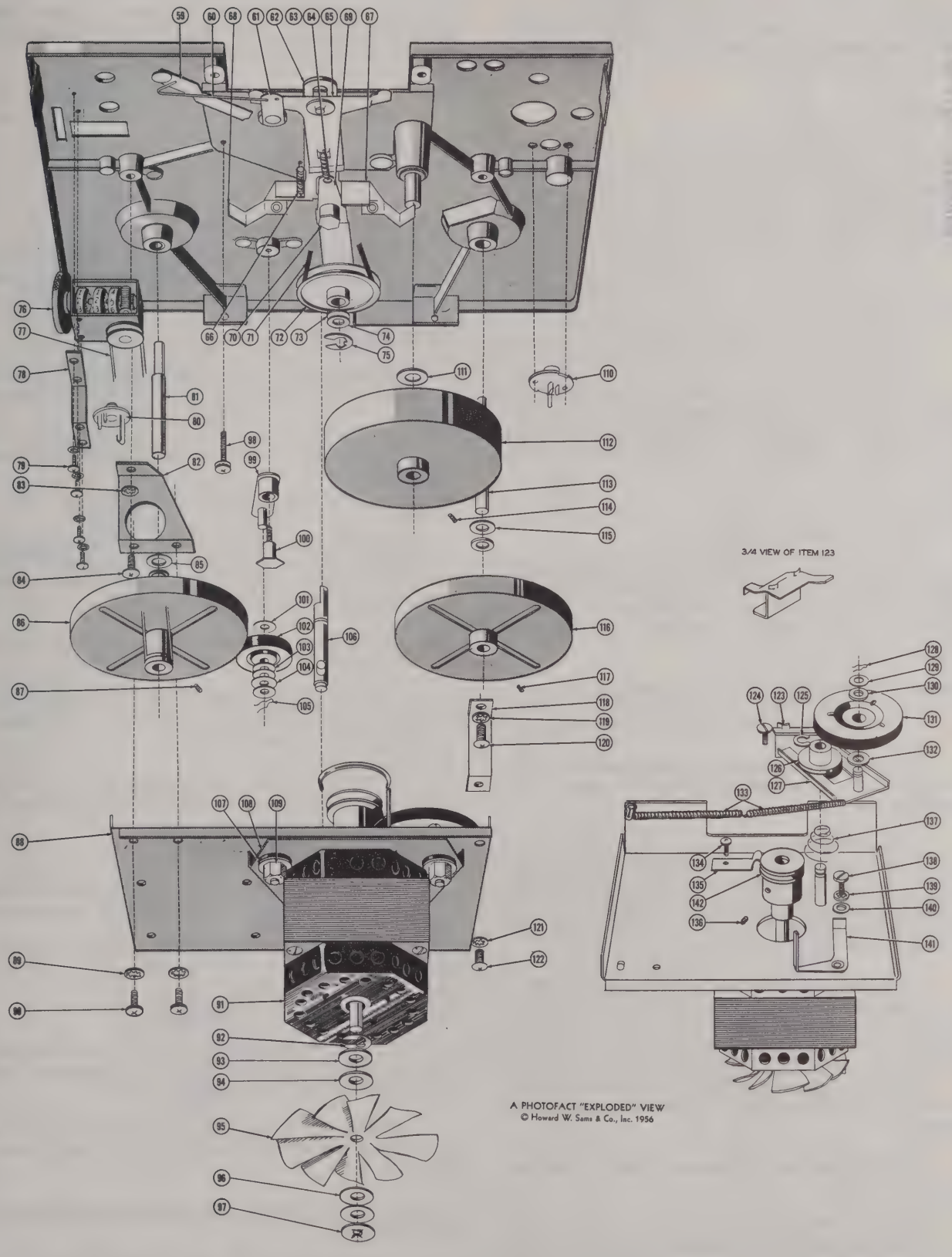


Figure 5B. Exploded View of Parts Below Baseplate.

torque will be insufficient to wind tape properly onto the takeup reel. In this case, the belt should be replaced as follows:

Remove rear escutcheon (12). Remove take-up reel pan (5). With the "Stop" button depressed, remove old spring drive belt from around pressure roller (56) and lift belt clear of recorder. Install new belt by reversing the above procedure.

Bias Adjustment-

Turn the recorder on and depress the "Record" button; use no tape. To determine if the bias is within satisfactory limits without dismantling the unit, merely connect a VTVM from the top lug of the recording head to chassis. If 75 to 100 volts are present no adjustment is necessary.

If the readings are outside of this range, proceed as follows:

1. Try new 5879, 12AX7, 6AQ5 and 6X4.

2. If still not within range, remove the chassis shield and connect a low capacity VTVM from test point "A" to chassis. Use low scale. Adjust trimmer M4 to obtain a reading of 2.25 volts. This provides the optimum in performance.

Neon Record Level Indicators

The neon record indicator firing level adjustment is only required if a neon bulb is replaced. The two neon indicators are adjusted for correct firing level by means of two trimmer capacitors, one for each indicator.

To adjust indicators proceed as follows:

1. Turn recorder on an depress "Record" button.

2. Connect a short jumper lead across the bias oscillator coil, L1 (short out the coil to disable the oscillator.)

3. Connect an audio oscillator, set at 1000 cycles, into the microphone input jack. Output of audio oscillator should be approximately .01 volt. (A1 volt output level may be used with a 100 to 1 reduction pad of resistors inserted between the audio oscillator and the microphone jack).

4. Connect probe of low capacity type AC VTVM to test point "B" (Junction of two 330KΩ resistors, R22 and R23, mounted on a terminal strip near the volume control.

5. Adjust volume control to obtain a reading of 36 volts on VTVM and leave control set and VTVM connected.

6. Disconnect shorting jumper from across bias oscillator coil.

7. Adjust "Normal" indicator trimmer M5A fully clockwise and then turn slowly counterclockwise so that upon loosening the trimmer the "Normal" bulb barely lights. This adjustment must be made loosening the trimmer.

8. Short out the bias oscillator coil.

9. Increase volume control to obtain a reading of 88 volts on the VTVM.

10. Remove short from bias oscillator coil.

11. Adjust "Overload" indicator trimmer M5B as described in step "7" for just barely lighting the "Overload" indicator bulb.

IMPORTANT: Do not readjust the recording bias oscillator after setting the indicator light adjustments.

TROUBLES

Push Buttons Fail To Latch Into Position-

1. Lock plate spring (28) loose or broken, resulting in the lock plate not being held against the hinge bracket (27).

Fails To Erase-

1. Spring (38) loose or broken, resulting in the erase head (44) not being pulled forward to engage the tape.

2. Erase head not aligned properly. See "Erase Head Adjustment".

Speed Variation Or "Wow-

1. Check the capstan (20), pinch roller (56), idler wheel (131), motor pulley (142), and flywheel (112) for oil or foreign material on these driving surfaces. Clean these parts with a good cleaning fluid.

2. Check motor pulley (142) to see if it is secured to motor shaft.

3. Check idler tension springs (133); see if they are holding idler wheel (131) in firm contact with motor pulley (142) and flywheel (112).

4. Idler slide plate (127) binding on slide bushing (126), preventing idler wheel (131) from making positive contact with the motor pulley and flywheel.

No Fast Forward Or Reverse-

1. Idler lever tension spring (64) may be loose or broken; if so, idler lever (69) will not be actuated.

2. Check idler drive belt (71) to see if it is properly connected.

No Drive On Record Or Playback-

1. Idler tension springs (133) loose or broken, thereby not holding idler wheel (131) in engagement with motor pulley (142) and flywheel (112).

2. Idler slide plate (127) binding on slide bushing (126), thus preventing idler wheel (131) from moving forward.

Tape Fails To Wind On Take-Up Reel During Record Or Playback-

1. Reel drive spring (20) loose or broken. See "Adjustment For Slow Take-Up Reel".

2. Brake drum shaft (113) binding. Clean foreign matter from bearing surface.

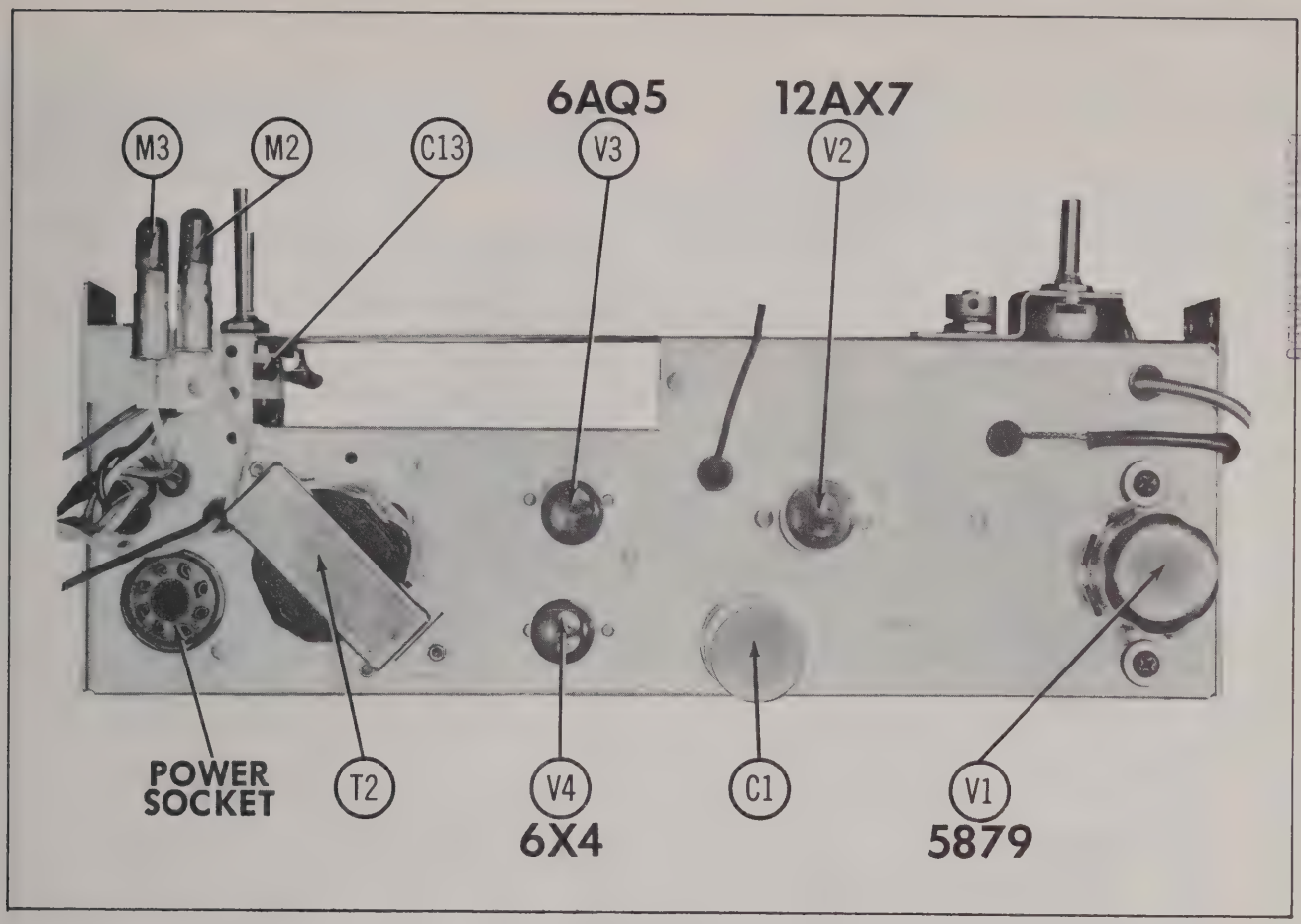


Figure 6

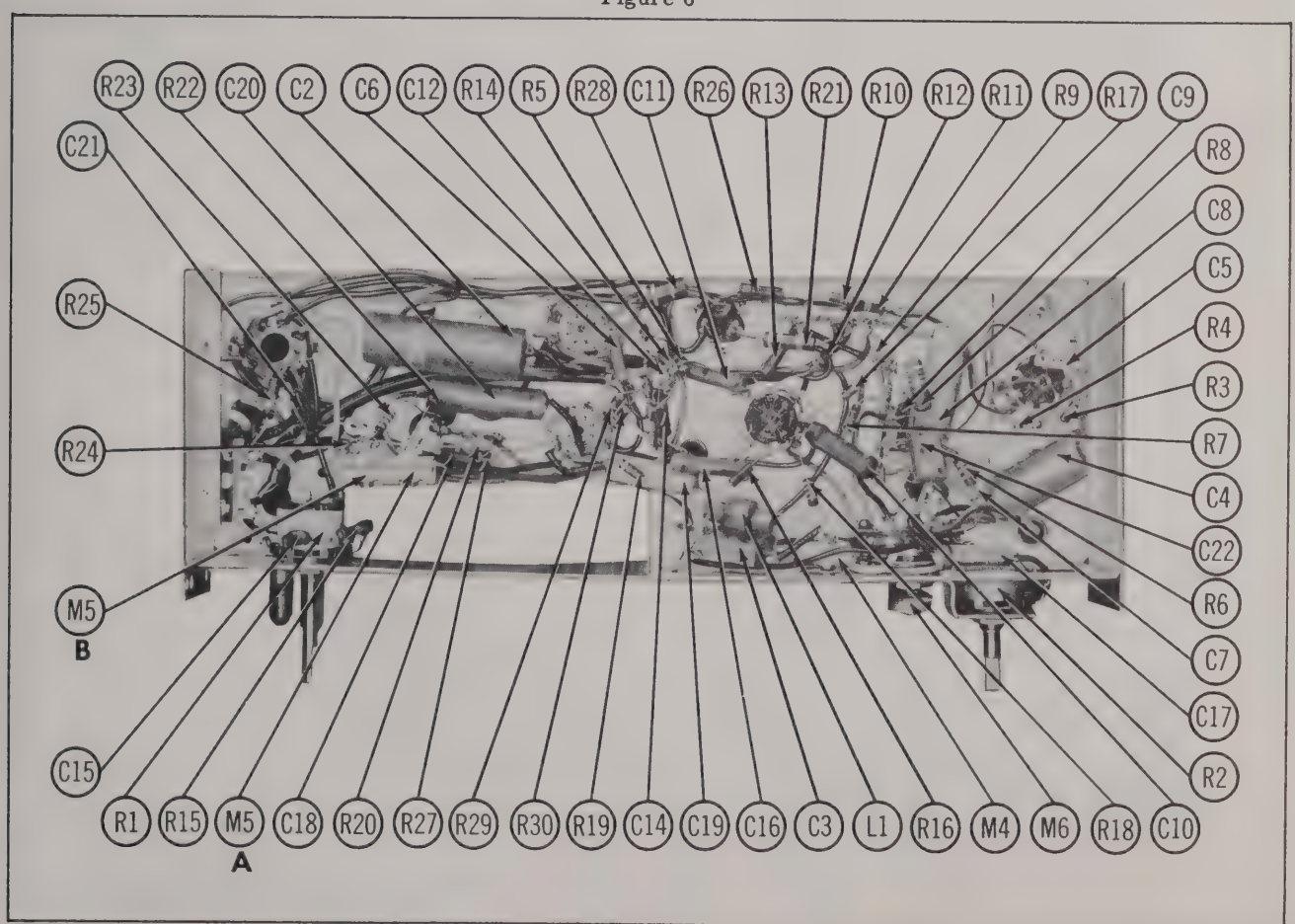
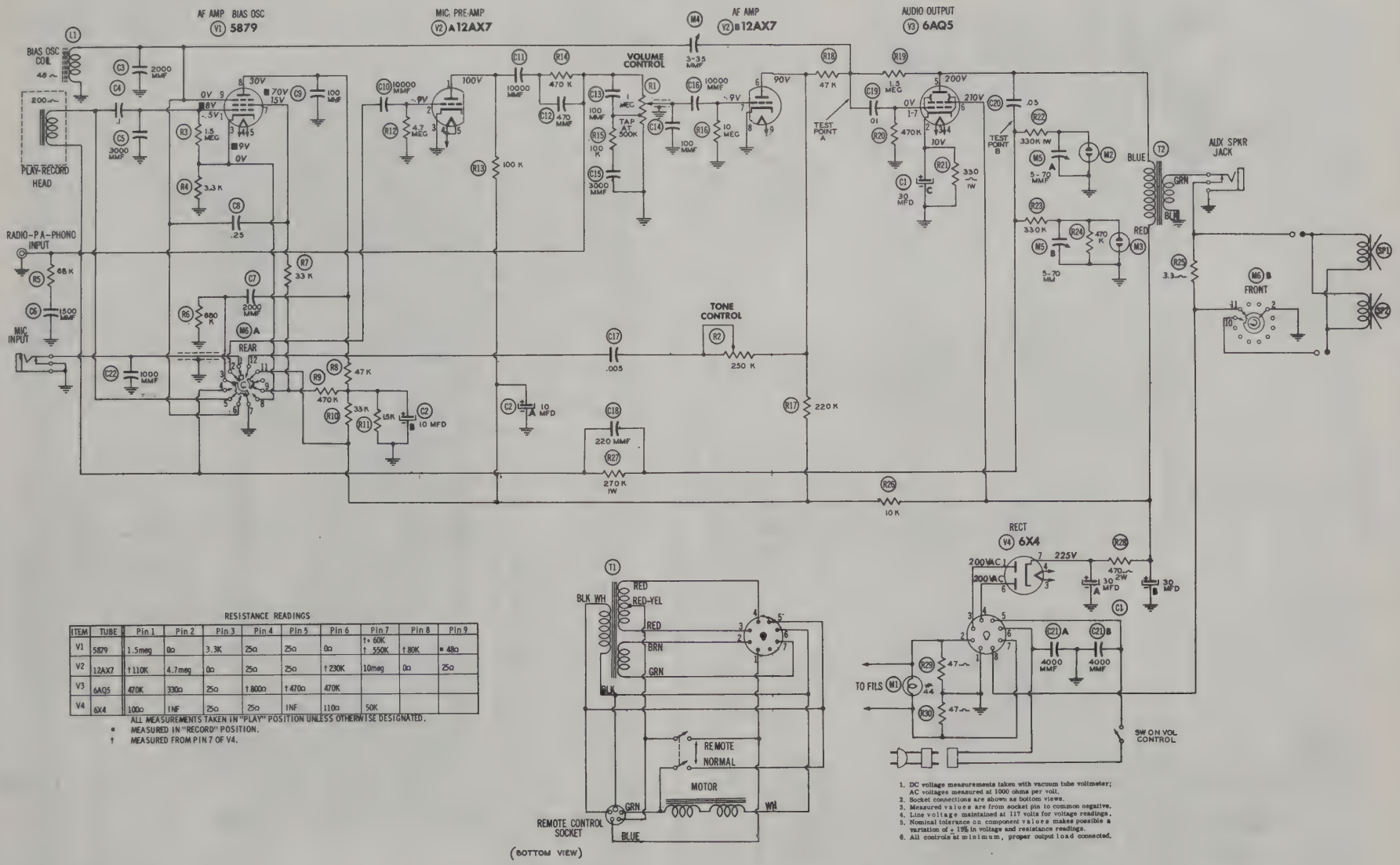


Figure 7



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5879	1.5meg	0Ω	3.3K	25Ω	25Ω	0Ω	†+ 60K † 550K	†80K	* 48Ω
V2	12AX7	†110K	4.7meg	0Ω	25Ω	25Ω	†230K	10meg	0Ω	25Ω
V3	6AQ5	470K	330Ω	25Ω	†800Ω	†470Ω	470K			
V4	6X4	100Ω	INF	25Ω	25Ω	INF	110Ω	50K		

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
* MEASURED IN "RECORD" POSITION.
† MEASURED FROM PIN 7 OF V4.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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CLEANING

The record head, capstan and pressure roller are subject to an accumulation of tape coating residue, which is worn off the tape as it passes these parts. Use a soft cloth and alcohol to clean the head surfaces, capstan and pressure roller.

CAUTION: Do not use a brush when cleaning the recording head as this could possibly mar the metal pole piece.

LUBRICATION

All rotating parts are provided with generous size oilite bearings, which are factory lubricated and require no further attention.

An occasional cleaning out of foreign matter under the plastic push button cover is desirable, and a small drop of oil on the sliding lever members is advisable.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	206878	Speed Shift Knob, Blue (SRT-402)
	206710	Speed Shift Knob, Green (SRT-401)
2	203769	Washer Control Knob Felt
3		#6-32 x 3/16" B.H. Screw
4		#6 Internal Lockwasher
5	206877	Take-up Reel Shaft & Holder, With Pulley, Blue (SRT-402)
	206697	Take-up Reel Shaft & Holder, With Pulley, Green (SRT-401)
6	205866	Washer
7	206868	Control Knob, Blue (SRT-402)
	206715	Control Knob, Green (SRT-401)
8	206887	Feed Reel Shaft & Holder, Blue (SRT-402)
	206697	Feed Reel Shaft & Holder, Green (SRT-401)
9	206869	Record Lock Button (SRT-402)
	206716	Record Lock Button (SRT-401)
10		#6-32 x 1/2" O.H. Phil. Hd. Screw
11		#6-32 x 1" O.H. Phil. Hd. Screw
12	206886	Rear Escutcheon, Blue (SRT-402)
	206713	Rear Escutcheon, Green (SRT-401)
13	206867	Front Escutcheon, Blue (SRT-402)
	206714	Front Escutcheon, Green (SRT-401)
14		#6-32 x 7/16 R.H. Screw
15		#6 - Internal Lockwasher
16	98802	Button Retainer Bracket
17	76220	"E" Ring
18		Keps 6-32 x 3/8" Hex Nut & Ext. Lockwasher
19	206876	Base Plate Assembly, Blue Hammertex
	206684	Base Plate Assembly, Green Hammertex
20	204213	Flywheel, Capstan
21	206698	Take-up Reel Drive Belt, Spring
22		#6-32 x 1/2" B.H.
23		#6 Lockwasher
24	203703	Button Lever Assembly
25	206865	Push Button (Blue) (SRT-402)
	206687	Push Button (Green) (SRT-401)
26	98818	Button Return Spring
27	204626	Button Hinge Bracket
28	988819	Button Lock Plate Spring
29	204627	Button Locking Plate
30		Washer
31		Internal Lockwasher
32		#6-32 x 3/16" Phil. Hd. Screw
33	206719	#6-32 x 3/16", Bristol Hd. Set Screw
34	206700	Tape Guide Left
35		Hex Nut
36	203696	Left Tape Guide Spacer
37	203695	Erase Head Plate
38	98816	Erase Head Tension Spring
39	98817	Record Actuating Lever
40		Felt Pad
41		Spring Adj. Screw
42	98808	Record Head
43		#2-56 Nut
44	98845	Erase Head
45		Flat Washer
46	98815	Record Slide Plate
47	203697	Playback Slide Plate
48	98812	Pressure Roller Spring
49	98814	Pressure Pad Spring Assembly
50	74788	Push-On Nut
51	98813	Playback Slide Plate Assembly
52	206719	#6-32 x 3/16 Bristol Hd. Set Screw
53	206701	Tape Guide Right
54	76744	Hair Pin Clip
55	98809	Linen Washer
56	206695	Pressure Roller
57	98809	Linen Washer
58	206694	Pressure Roller Plate
59	206696	Record Interlock Spring
60	98825	Switch Arm Link
61	203699	Switch Lever
62	98821	Brake Slide Plate Assembly
63	74788	Push-On Nut
64	98822	Idler Tension Spring
65	98823	High Speed Shift Plate
66	98820	Brake Return Spring
67	206690	Brake & Slide Plate Assembly
68		Brake Pad
69	206691	Idler Lever Assembly
70	98853	8-32 Shoulder Screw
71	98830	Idler Drive Belt Rubber
72		Idler Drive Pulley
73		Washer
74	205867	Washer
75		"C" Washer
76	206720	Counter (Used on Model SRT-402)
77	206874	Counter Drive Belt
78		Counter Bracket
79		Counter Mounting Screws
80	7903	Input Jack
81	206723	Brake Drum Shaft
82		Drive Mounting Plate
83		#8 Lockwasher
84		#8-32 x 1/4" B.H. Screw
85	205866	Washer
86	206721	Brake Drum Assembly, With Pulley
87	26619	Brake Drum Set Screw
88	206703	Drive Mounting Plate Assy.
89		#8 External Lockwasher
90		#8-32 x 1/4" R.H. Screw
91	98836	Drive Motor
92	98837	"E" Ring

MECHANICAL PARTS LIST (Con't.)

Ref. No.	Part No.	Description
93		Flat Washer
94	203769	Felt Washer
95	98838	Fan
96	203769	Felt Washer
97	98839	Fan Fastener
98		Screw
99	98826	Sub Idler Plate Assembly
100		#8-32 x 5/16" B.H. Screw
101	98809	Linen Washer
102	98827	Sub Idler Wheel
103	205867	Washer
104	205867	Washer
105	76744	Hair Pin Clip
106	206727	Speed Control Shaft
107	98840	Grommet
108	206705	Motor Plate
109		Hex Nut
110	7903	Input Jack
111	98809	Linen Washer
112	204213	Flywheel
113	206689	Brake Drum Shaft
114		Allen Set Screw
115	205866	Laminated Washer
116	206688	Brake Drum Assembly
117	26619	Brake Drum Set Screw
118		Angle Mounting Bracket
119		#8 Ext. Lockwasher
120		#8-32 x 3/8" B.H.
121		#8 Internal Lockwasher
122		#8-32 x 3/8" R.H. Screw
123	206709	Speed Shift Lever
124		Screw
125	98847	"C" Washer
126	206135	Idler Slide Plate Bushing
127	206704	Idler Slide Plate
128	76744	Hair Pin Clip
129	98809	Linen Washer
130		Washer
131	98834	Idler Washer
132	98809	Linen Washer
133	98842	Idler Tension Spring
134		Screw
135		Speed Control Shaft Detent
136	26619	Motor Pulley Set Screw
137	98843	Idler Lift Compression Spring
138		#8-32 x 1/4" R.H. Screw
139		#8 Internal Lockwasher
140		#8 Flat Washer
141	203702	Idler Throw-out Lever
142	206051	Motor Pulley

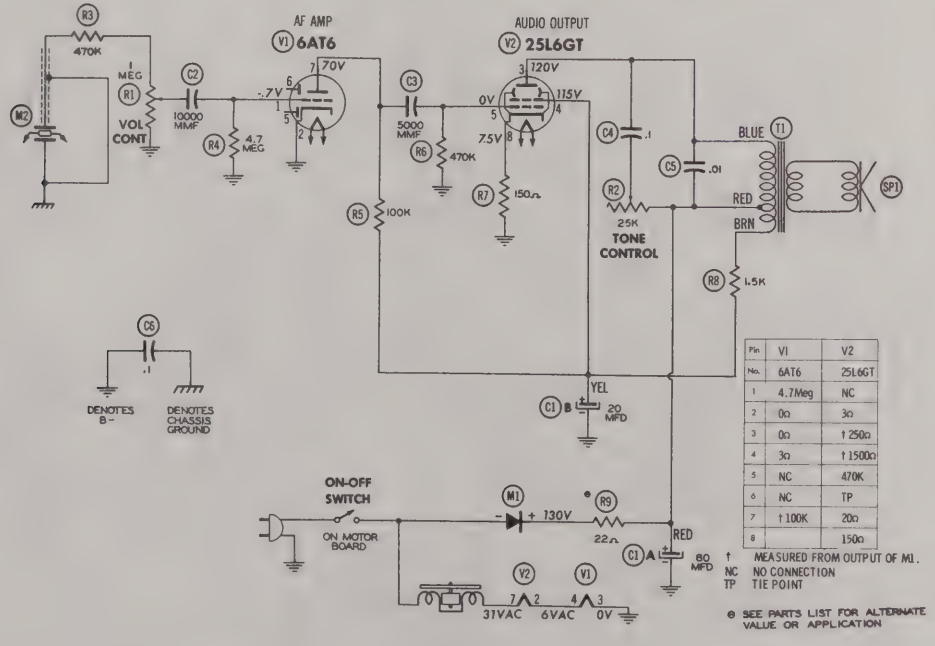
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
V1		5879 AF Amp. - Bias Osc.
V2		12AX7 Mic., Pre Amp., AF Amp.
V3		6AQ5 Audio Output
V4		6X4GT Rectifier
C1A	98787	Elect. Cap. 30MFD. @ 250V.
C1B		Elect. Cap. 30MFD. @ 250V.
C1C		Elect. Cap. 30MFD. @ 25V.
C2A	206536	Elect. Cap. 10MFD. @ 200V.
C2B		Elect. Cap. 10MFD. @ 200V.
C3	39659	Cap. Mica 2000MMF.
C4	73784	Cap. Paper .1MFD. @ 200V.
C5	98798	Cap. Ceramic 3000MMF.
C6	75610	Cap. Ceramic 1500MMF.
C7	206535	Cap. Paper .002MFD. @ 600V.
C8	78905	Cap. Paper .25MFD. @ 200V.
C9	75437	Cap. Ceramic 100MMF.
C10	206537	Cap. Ceramic 10000MMF.
C11	206537	Cap. Ceramic 10000MMF.
C12	94223	Cap. Ceramic 470MMF.
C13	75437	Cap. Ceramic 100MMF.
C14	75437	Cap. Ceramic 100MMF.
C15	98798	Cap. Ceramic 3000MMF.
C16	206537	Cap. Ceramic 10000MMF.
C17	73920	Cap. Paper .005MFD. @ 600V.
C18	77460	Cap. Ceramic 220MMF.
C19	73561	Cap. Paper .01MFD. @ 400V.
C20	73553	Cap. Paper .05MFD. @ 400V.
C21A	74009	Cap. Disc Dual 4000MMF.
C21B		Cap. Disc Dual 4000MMF.
C22	54677	Cap. Mica 1000MMF.
R1	98791	Vol. Cont. & Switch 1Meg.
R2	98792	Tone Control 250K
R3	31449	Resistor, 1.5Meg 1/2 Watt
R4	502233	Resistor, 3.3K 1/2 Watt
R5	502368	Resistor, 68K 1/2 Watt
R6	30562	Resistor, 680K 1/2 Watt
R7	502333	Resistor, 33K 1/2 Watt
R8	512347	Resistor, 47K 1/2 Watt
R9	502447	Resistor, 470K 1/2 Watt
R10	502333	Resistor, 33K 1/2 Watt
R11	36714	Resistor, 15K 1/2 Watt
R12	502547	Resistor, 4.7Meg 1/2 Watt
R13	502410	Resistor, 100K 1/2 Watt
R14	502447	Resistor, 470K 1/2 Watt
R15	502410	Resistor, 100K 1/2 Watt
R16	502610	Resistor, 10Meg. 1/2 Watt
R17	502422	Resistor, 220K 1/2 Watt
R18	502347	Resistor, 47K 1/2 Watt
R19	31449	Resistor, 1.5Meg. 1/2 Watt
R20	502447	Resistor, 470K 1/2 Watt
R21	512133	Resistor, 330Ω 1 Watt
R22	502133	Resistor, 330K 1/2 Watt
R23	502133	Resistor, 330K 1/2 Watt
R24	502447	Resistor, 470K 1/2 Watt
R25	94912	Resistor, 3.3Ω 1 Watt
R26	502310	Resistor, 10K 1/2 Watt
R27	19232	Resistor, 270K 1/2 Watt
R28	522147	Resistor, 470Ω 2 Watt
R29	502047	Resistor, 47Ω 1/2 Watt
R30	502047	Resistor, 47Ω 1/2 Watt
T1	98793	Power Trans. & Plug Assy.
T2	98794	Output Transformer
SP1	206347	5"Ω PM Speaker
SP2	77270	5" x 7" PM Speaker
L1	98789	Coil, Bias Osc. Inc. C-3
M1	11891	Pilot Lamp #44
M2	91749	Neon Lamp NE51 Normal Indicator
M3	91749	Neon Lamp NE51 Overload Indicator
M4	79780	Trimmer Bias Adj. (3-35MMF)
M5A	71496	Trimmer Normal Ind. (5-70MMF)
M5B		Trimmer Overload Ind. (5-70MMF)
M6A	98790	Play Record Sw. (Viewed from Rear)
M6B		Play Record Sw. (Viewed from Front)

RCA VICTOR MODELS
6-EY-3A, B (Ch. RS-152A)

TRADE NAME	RCA Victor Models 6-EY-3A, 6-EY-3B (Ch. RS-152A)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N.J.
TYPE SET	AC Operated Phono Amplifier with 45RPM Automatic Record Changer
TUBES (Two)	Types 6AT6 AF Amplifier, 25L6GT Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .37 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE RCA VICTOR MODEL RP-190 SERIES - PHOTOFACT SET 144 - FOLDER 7 OR RECORD CHANGER MANUAL CM-4.



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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	6AT6	

ITEM No.	USE	TYPE	NOTES
V2	Output	25L6GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	100269	PRS150V20-80	BBRT44215		TML-1		TVA-2460
B	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	10000		73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C3	5000		98068	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C4	.1	200	73784	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C5	.01	400	73561	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C6	.1	400	73551	P488N-1	DF-104	CUB2P1		PT401	2TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	101436	AB-70	A47-1Meg-Z	Q13-137	U-54	Volume
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R1A
R2A	25K	½	101437	AB-26	A47-25K-S	Q11-120	U-26	Tone
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R2A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R3	470K		502447	BTS-470K	
R4	4.7Meg		30931	BTS-4.7Meg	
R5	100K		502410	BTS-100K	
R6	470K		502447	BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R7	150Ω		502115	BTS-150	
R8	1500Ω		502215	BTS-1500	
R9	22Ω			BTS-22	Note 1

Note 1. Some versions use 47Ω resistor in this application (part #502047).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.8K	3-4Ω	75939	Z1102 ①	A3031 ①	A3336 ①	24S50A①	S-16X	① Drill one new mounting hole.

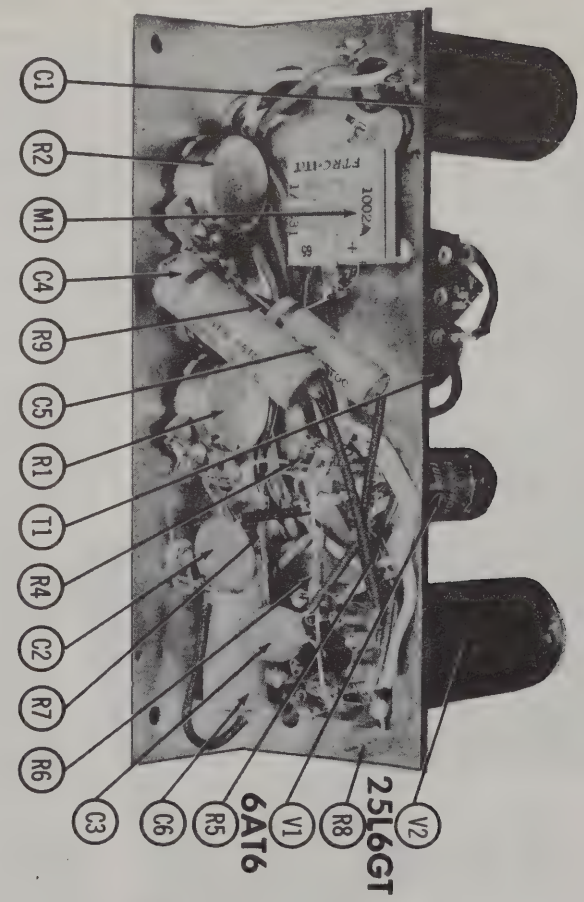
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	79696	4A07	223S1	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	RCA Victor PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.044A	75940	1002A	RS050	6S65	8J1	65	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	RCA Victor PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	76318	408	N-10-1J	44	0-1 or S-1	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTNGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	RCA Victor PART No.	FIDELITONE PART No.	JENSEN PART No.	WALCO PART No.	
M3	75496	†A-98 or ♦A-98D	*M-75LP or †M-74LP or ♦M-74LPD	*W-44MGA or †W-44MGS or ♦W-44MGD	* Metal † Jewel ♦ Diamond

RAULAND MODEL HF355

RAULAND MODEL HF355

RAULAND MODEL HF355

TRADE NAME	Rauland Model HF355	
MANUFACTURER	Rauland-Borg Corp., 3515 W. Addison St., Chicago 18, Ill.	
TYPE SET	AC Operated FM-AM Superheterodyne Receiver	
TUBES	Eighteen	
POWER SUPPLY	105-125 Volts AC-60 Cycles	RATING .95 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	550KC-1630KC	FREQ. MOD. 88MC-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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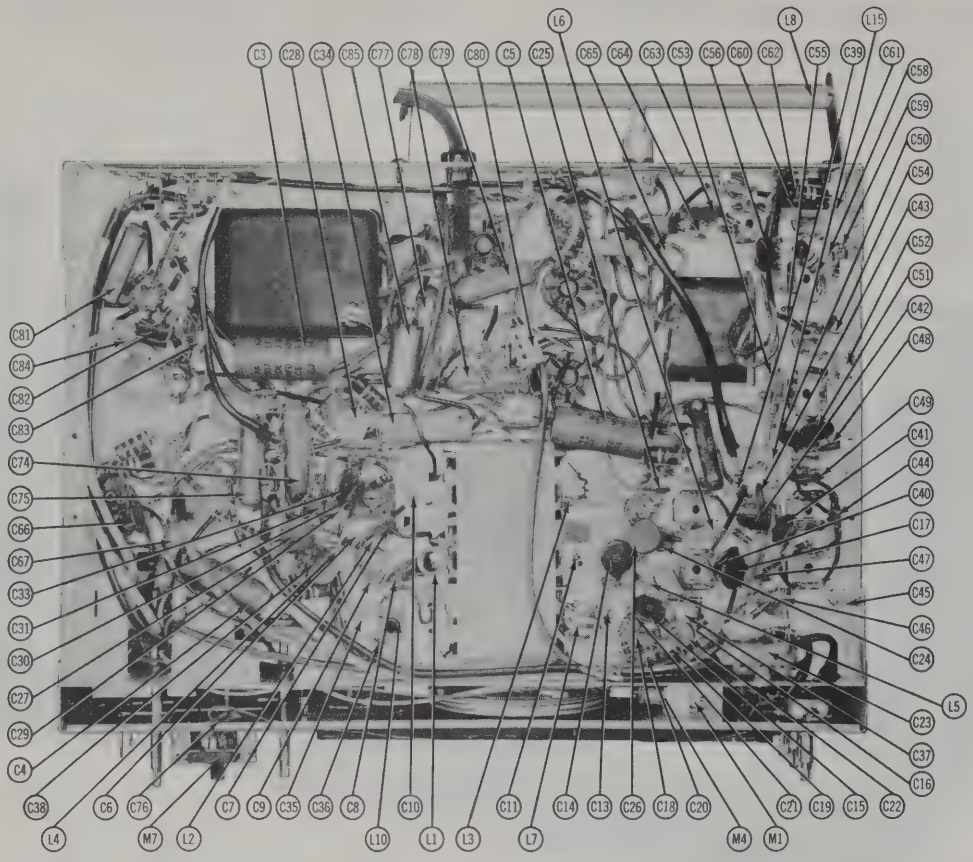
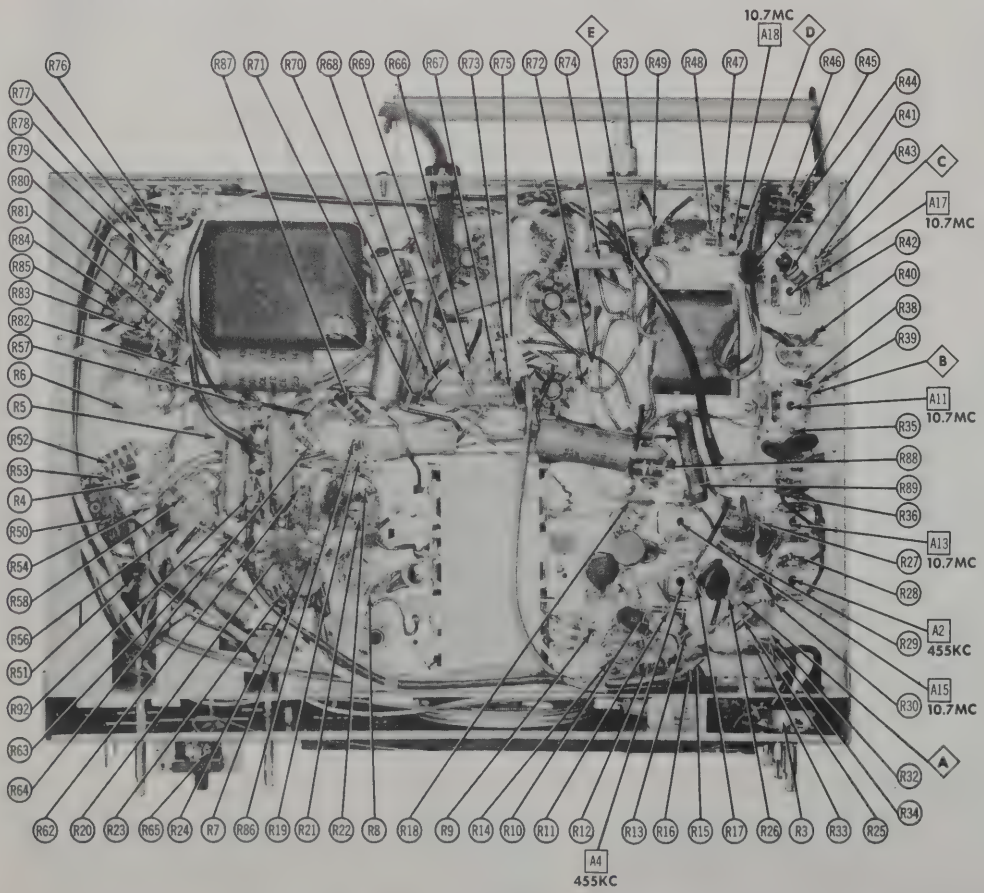
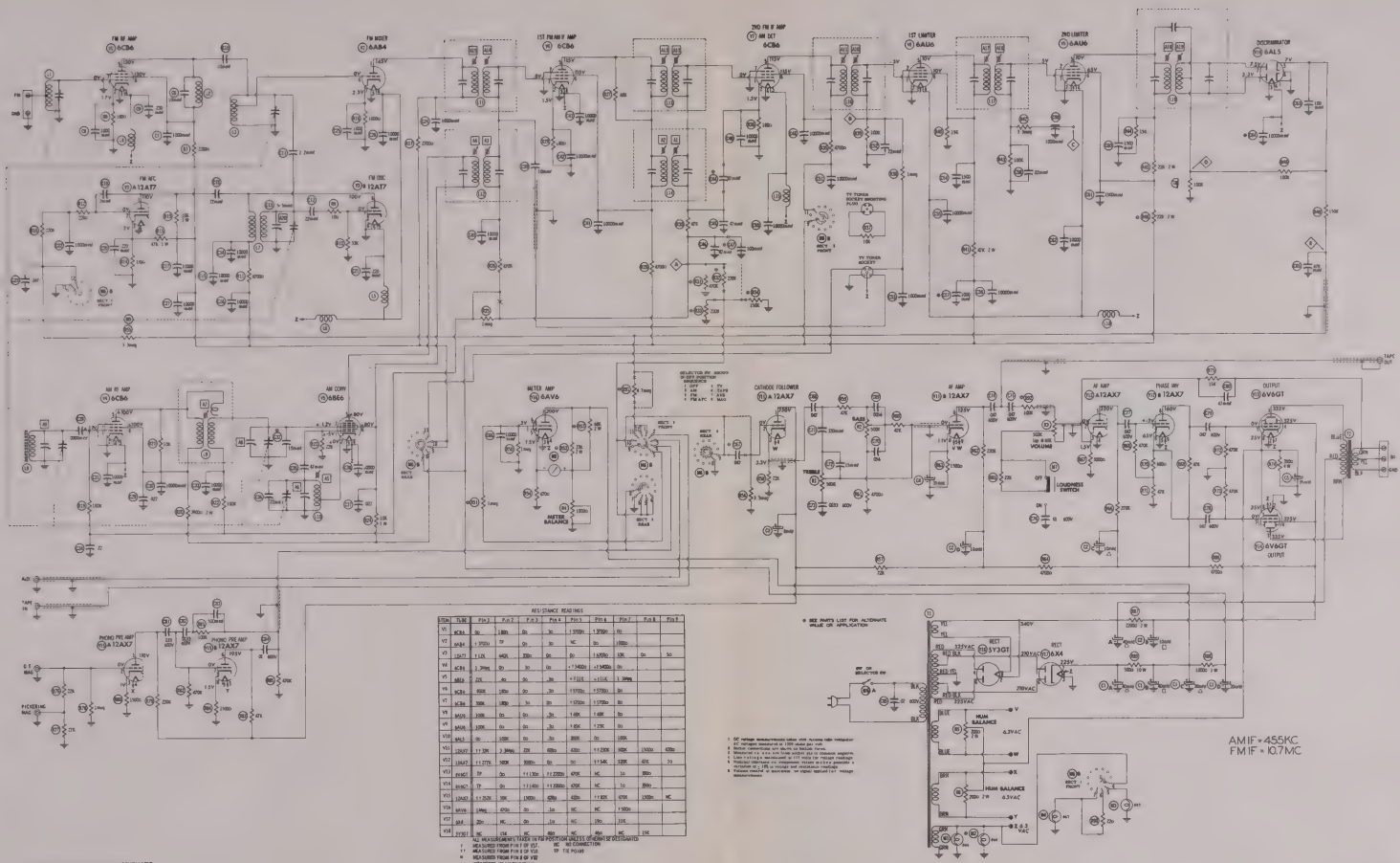


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

TUBE	TYPE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	3Ω	180Ω	0Ω	3Ω	1.370Ω	1.370Ω	0Ω		
V2	6BE6	1.350Ω	0*	0Ω	3Ω	NC	0Ω	180Ω		
V3	12AT7	1.12Ω	640Ω	200Ω	0Ω	0Ω	1.160Ω	10K	0Ω	3Ω
V4	6CB6	1.29Ω	0Ω	3Ω	0Ω	1.540Ω	1.540Ω	0Ω		
V5	6BE6	27K	0Ω	0Ω	3Ω	1.11K	1.11K	1.38Ω		
V6	6CB6	850Ω	180Ω	0Ω	3Ω	1.370Ω	1.370Ω	0Ω		
V7	6CB6	300Ω	180Ω	3Ω	0Ω	1.370Ω	1.370Ω	0Ω		
V8	6AU6	100Ω	0Ω	0Ω	3Ω	1.6K	1.6K	0Ω		
V9	6AU6	100K	0Ω	0Ω	3Ω	1.6K	1.2K	0Ω		
V10	6AL5	0Ω	150Ω	0Ω	3Ω	280K	0Ω	100K		
V11	12AT7	11.2K	1.3MΩ	22K	420Ω	420Ω	11.2K	100K	1.2KΩ	420Ω
V12	12AT7	11.27K	140K	100Ω	0Ω	0Ω	11.54K	220K	42K	3Ω
V13	6V6GT	0*	0Ω	11.13K	11.270Ω	470K	NC	1Ω	350Ω	
V14	6V6GT	0*	0Ω	11.14Ω	11.280Ω	470K	NC	1Ω	350Ω	
V15	12AX7	11.2K	10K	1.14K	420Ω	420Ω	11.8Ω	470K	1.12Ω	NC
V16	6AV6	1.4MΩ	470Ω	0Ω	1Ω	NC	NC	1.4KΩ		
V17	6X4	20Ω	NC	0Ω	1Ω	NC	13Ω	33K		
V18	5Y3GT	NC	1Ω	0Ω	0Ω	NC	0Ω	NC	1Ω	

ALL MEASUREMENTS TAKEN IN FOR POSITION UNLESS OTHERWISE DESIGNATED
1. MEASURED FROM PIN 1 OF V17.
2. MEASURED FROM PIN 8 OF V13
3. MEASURED FROM PIN 8 OF V18
4. MEASURED IN AM POSITION.

NC NO CONNECTION
OF THE PLUG

* SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with Hycone tube voltmeter.
2. AC voltages measured on 1.25V scale per volt.
3. Socket connections are shown as bottom views.
4. Line voltage is assumed at 117 volts for proper readings.
5. Tolerance on resistance values is ±10% unless otherwise noted.
6. Values shown are average and minimum readings.
7. Volume control is maximum, all signal controls average positions shown.

A PHONOFACT STANDARD NOTATION SCHEMATIC
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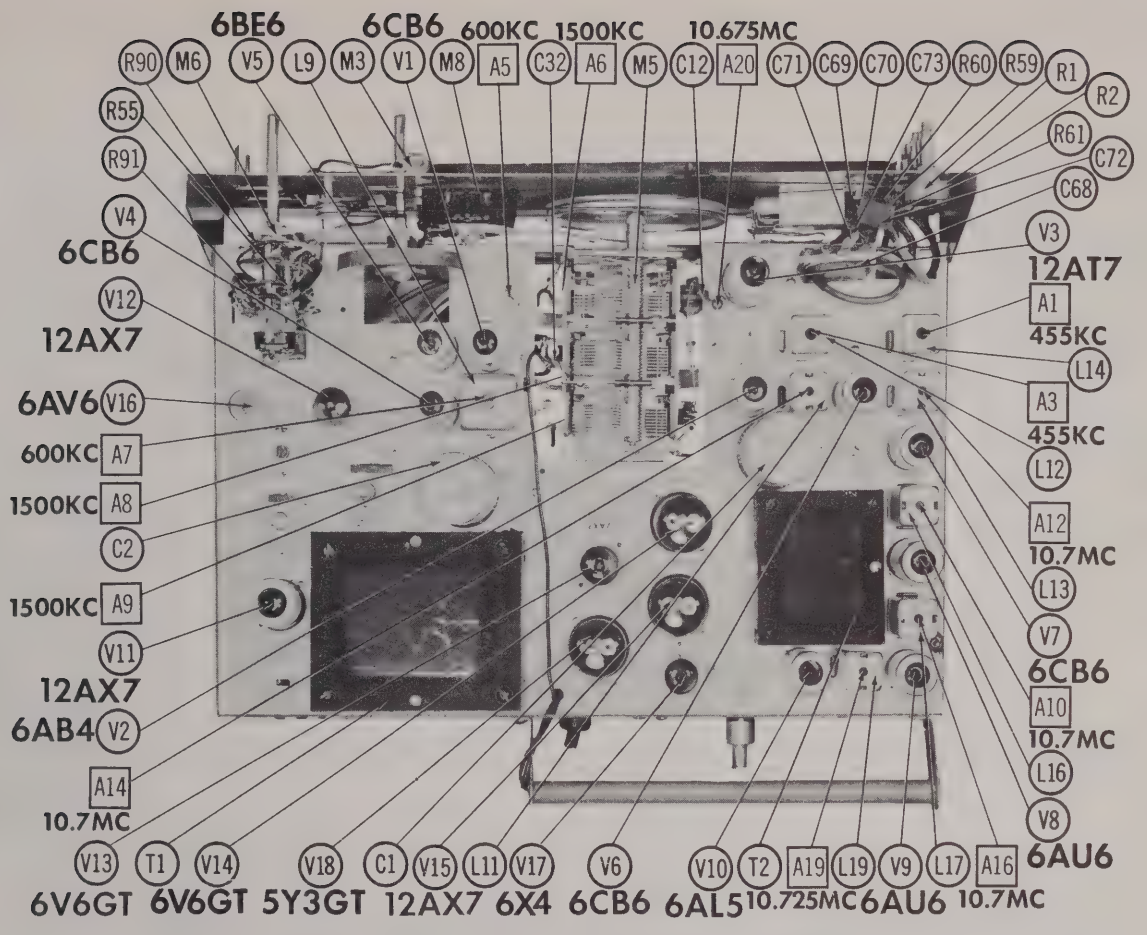
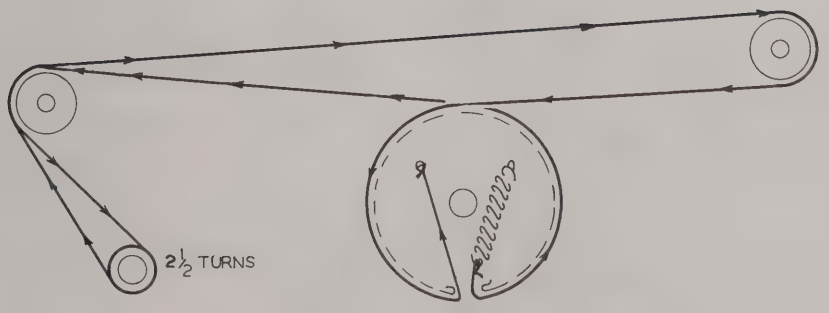


CHASSIS TOP VIEW

TUNING GANG FULLY CLOSED



DIAL CORD STRINGING

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Turn volume control to minimum.
To set pointer, fully open tuning gang. Set pointer at right ends of the 2 horizontal lines.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V5). Low side to chassis.	455KC (400~Mod)	AM	Point of non-interference	DC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.		Loop	600KC	"	600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	"	1500KC	"	A6	"
4.		"	600KC	"	Tune to 600KC signal	"	A7	"
5.		"	1500KC	"	Tune to 1500KC signal	"	A8, A9	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 6 (grid) of 6AB4 (V2). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point (B). Common to chassis.	A10, A11, A12, A13, A14, A15	Adjust for maximum deflection.
7.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A16, A17	"
8.	"	"	"	"	"	DC probe to point (D). Common to chassis.	A18	"
9.	"	"	"	"	"	"	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
10.	"	"	10.725MC 10.675MC	"	"	"	A18	Vary generator frequency 25KC above and below 10.7MC. Meters deflections should be nearly equal above and below 10.7MC. If necessary, retouch A10 thru A17 until nearly equal meter deflection above and below 10.7MC are obtained.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 6 (grid) of 6AB4 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point (B). Low side to chassis.	A10, A11, A12, A13, A14, A15	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
7.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A16, A17	"
8.	"	"	"	"	"	Vert. Amp. to point (D). Low side to chassis.	A18	"
9.	"	"	"	"	"	Vert. Amp. to point (E). Low side to chassis.	A19	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A18 for maximum amplitude and straightness of crossover lines. Proceed with Step 12.

TUNING METER ADJUSTMENT

11. Adjust meter balance control (R4) until meter needle is in the horizontal (zero) position.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
12.	270Ω Carbon Resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	108MC	FM	108MC	DC probe to point (B). Common to chassis.	A20, L7	Adjust A20 for maximum deflection. Adjust L7 for maximum deflection by compressing or expanding the coil turns.
13.	"	"	88MC	"	88MC	"	L3, L1	Adjust for maximum deflection by compressing or expanding the coil turns.

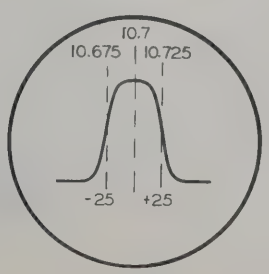


FIG. 1

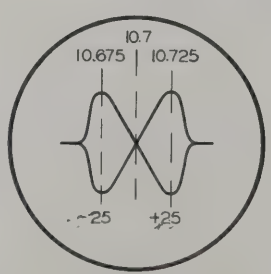


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6CB6	
V2	FM Mixer	6AB4	
V3	FM Oscillator-AFC	12AT7	
V4	AM RF Amplifier	6CB6	
V5	AM Converter	6BE6	
V6	1st. IF Amplifier	6CB6	
V7	2nd. FM IF Amplifier-AM Detector	6CB6	
V8	1st. Limiter	6AU6	
V9	2nd. Limiter	6AU6	
V10	Discriminator	6AL5	
V11	Cathode Follower-AF Amplifier	12AX7	
V12	Phase Inverter	12AX7	
V13	Output	6V6GT	
V14	Output	6V6GT	
V15	Phono Preamplifier	12AX7	
V16	Meter Amplifier	6AV6	
V17	Rectifier	6X4	
V18	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RAULAND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	300		AFH4-02-10	D005	FP419.5	TMQ-3	T-540	TVL-4580
B	■40	300					TD-20-350	MT-2520	
C	▲30	250							
D	20	200							
C2A	▲40	450		AFH4-17	D016	FP475.5	TMQ-17	Q-055	TVL-4840
B	■10	450							
C	▲10	450							
D	10	450							
C3	8	450		PRS450V8	BR845	TC71	TD-8-450	FM-4508	TVA-1704
C4	35	50		PRS50V50	BR505	TC39	TD-50-50	FM-0550	TVA-1308
C5	35	50		PRS50V50	BR505	TC39	TD-50-50	FM-0550	TVA-1308

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RAULAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	10			NP0-DI10	TCZ-10	Z018	NP0A-100	ZT-541	5TCC-Q1	
C7	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C8	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C9	220			DI-00022	DD-221	G051	811-221	UC-5322	5GA-T22	
C10	10			NP0-DI10	TCZ-10	Z018	NP0A-100	ZT-541	5TCC-Q1	
C11	2.2			NP0-SI2.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	
C12	22			NP0-DI22	TCZ-22	Z024	NP0K-220		5TCC-Q22	
C13	.5-3				829-3		3115-01-0R5	CT565A		
C14	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C15	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C16	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C17	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C18	22			NP0-DI22	TCZ-22	Z024	NP0K-220		5TCC-Q22	
C19	2			NP0-SI2.2	TCZ-2R2	Z005	NP0A-2R2		5TCCB-V22	
C20	220			DI-00022	DD-221	G051	811-221	UC-5322	5GA-T22	
C21	220			DI-00022	DD-221	G051	811-221	UC-5322	5GA-T22	
C22	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C23	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C24	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C25	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C26	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C27	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C28	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C29	.022	200		BPD-02	DF-203	CUB4S22	817-02	PT4122	2TM-S22	
C30	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C31	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C32	10			NP0-DI10	TCZ-10	Z018	NP0A-100	ZT-541	5TCC-Q1	Note 1
C33	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C34	.22	200		P288N-22		CUB2P22		PT4022	2TM-P22	
C35	47			NP0-DI47	TCZ-47	Z033	NP0-338-470	ZT-5447	5TCC-Q47	
C36	22			NP0-DI22	TCZ-22	Z024	NP0K-220		5TCC-Q22	
C37	.022	200		BPD-02	DF-203	CUB4S22	817-02	PT4122	2TM-S22	
C38	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C39	10			NP0-DI10	TCZ-10	Z018	NP0A-100	ZT-541	5TCC-Q1	
C40	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C41	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RAULAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C42	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C43	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C44	47			NP0-DI47	TCZ-47	Z033	NP0-338-470	ZT-5447	5TCC-Q47	Note 2
C45	47			NP0-DI47	TCZ-47	Z033	NP0-338-470	ZT-5447	5TCC-Q47	
C46	47			NP0-DI47	TCZ-47	Z033	NP0-338-470	ZT-5447	5TCC-Q47	
C47	100			NP0-DI100	TCZ-100	TZ30	NP0-337-101	ZT-531	5TCC-T1	Note 2
C48	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C49	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C50	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C51	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C52	22			NP0-DI22	TCZ-22	Z024	NP0K-220		5TCC-Q22	
C53	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C54	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C55	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C56	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C57	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	Note 2
C58	22			NP0-DI22	TCZ-22	Z024	NP0K-220		5TCC-Q22	
C59	1000									
C60	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C61	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C62	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C63	100			NP0-DI100	TCZ-100	TZ30	NP0-337-101	ZT-531	5TCC-T1	
C64	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	Note 2
C65	470			BPD-00047	DD-471	K060	811-471	UC-5347	5GA-T47	
C66	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C67	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	Note 2
C68	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C69	.0056	200		SI5600	D6-562	TP56	GP3-333-562			
C70	.056	200								
C71	330			BPD-00033	DD-331	G056	811-331		5GA-T33	
C72	15	500		SI15	D6-150	G021	GP1K-150	UC-5415	5GA-Q15	
C73	.0033	600		BPD-0033	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C74	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C75	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C76	.01	600		BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C77	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C78	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C79	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C80	47	500		BPD-000047	DD-470	G033	GP1K-470	UC-5447	5GA-Q47	
C81	.033	600		BPD-03	DF-303	CUB6S33		PT6133	6TM-S33	
C82	.0033	600		BPD-0033	D6-333	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C83	500			BPD-0005	DD-501	G061	811-501	UC-535	5GA-T5	
C84	.01	600		BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C85	.02	600		P689XP-02						

Note 1. Some versions may use 5MMF in this application.
Note 2. Not used in some versions.

PROPERTY OF
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DENVER, COLORADO

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RAULAND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	RP-504AJ	AB-60	A47-500K-Z	Q13-133	U48	Treble
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A
R2A	500K	½	RP-504AJ	AB-60	A47-500K-Z	Q13-133	U48	Bass
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R2A
R3A	500K	½	RP-504AH	ABT-63	A47F4-500K	Q18-133X	UT-429	Volume-Tapped @ 60K
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R3A
R4	1000Ω	½	RP-102C				TA13L	Meter Balance
R5A	200Ω	2		V-123	A43-200	WPK200	C200P	Amp. Hum Balance-wirewound
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	Attach to R5A
R6A	200Ω	2		V-123	A43-200	WPK200	C200P	Phono Hum Balance-wirewound
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	Attach to R6A

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RAULAND PART No.	IRC PART No.	
R7	2200Ω			BTS-2200	
R8	180Ω			BTS-180	
R9	10Ω			BTS-10	
R10	33K			BTS-33K	
R11	4700Ω			BTS-4700	
R12	220Ω			BTS-220	
R13	10K	1		BTA-10K	
R14	330Ω			BTS-330	
R15	47K	1		BTA-47K	
R16	220K			BTS-220K	
R17	2200Ω			BTS-2200	
R18	1000Ω			BTS-1000	
R19	100K			BTS-100K	
R20	3900Ω	2		BTB-3900	
R21	10K			BTS-10K	
R22	100K			BTS-100K	
R23	22K			BTS-22K	
R24	10K	1		BTA-10K	
R25	1Meg			BTS-1Meg	
R26	470K			BTS-470K	
R27	68K			BTS-68K	
R28	4700Ω			BTS-4700	
R29	180Ω			BTS-180	
R30	47K			BTS-47K	
R31	470K			BTS-470K	Note 1
R32	220K			BTS-220K	Note 1
R33	220K			BTS-220K	Note 1
R34	150K			BTS-150K	Note 1
R35	4700Ω			BTS-4700	
R36	180Ω			BTS-180	
R37	10K			BTS-10K	
R38	1Meg			BTS-1Meg	
R39	100K			BTS-100K	
R40	15K			BTS-15K	
R41	47K	2		BTB-47K	
R42	3.3Meg			BTS-3.3Meg	
R43	100K			BTS-100K	
R44	15K			BTS-15K	
R45	22K	2		BTB-22K	
R46	22K	2		BTB-22K	Note 2
R47	100K 5%			BTS-100K 5%	
R48	100K 5%			BTS-100K 5%	
R49	150K			BTS-150K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RAULAND PART No.	IRC PART No.	
R50	1Meg			BTS-1Meg	
R51	1Meg			BTS-1Meg	Note 3
R52	33K	2		BTB-33K	Note 4
R53	68K	2		BTB-68K	Note 4
R54	470Ω			BTS-470	
R55	3.3Meg			BTS-3.3Meg	
R56	3.3Meg			BTS-3.3Meg	
R57	22K			BTS-22K	
R58	22K			BTS-22K	
R59	47K			BTS-47K	
R60	47K			BTS-47K	
R61	4700Ω			BTS-4700	
R62	220K			BTS-220K	
R63	1500Ω			BTS-1500	
R64	4700Ω			BTS-4700	
R65	22K			BTS-22K	
R66	270K			BTS-270K	
R67	3000Ω 5%			BTS-3000 5%	
R68	470K			BTS-470K	
R69	47K			BTS-47K	
R70	680Ω			BTS-680	
R71	47K			BTS-47K	
R72	470K			BTS-470K	
R73	470K			BTS-470K	
R74	350Ω	4		1 3/4A-350	
R75	15K			BTS-15K	
R76	22K			BTS-22K	
R77	27K			BTS-27K	
R78	1Meg			BTS-1Meg	
R79	220K			BTS-220K	
R80	1500Ω			BTS-1500	
R81	100K			BTS-100K	
R82	470K			BTS-470K	
R83	47K			BTS-47K	
R84	1500Ω			BTS-1500	
R85	470K			BTS-470K	
R86	4700Ω			BTS-4700	
R87	2200Ω	2		BTB-2200	
R88	1000Ω	1		BTA-1000	
R89	500Ω	10		1 3/4A-500	
R90	22Ω			BTS-22	
R91	4.7Meg			BTS-4.7Meg	Note 1
R92	100K			BTS-100K	Note 1

Note 1. Not used in some versions.
Note 2. Some versions use 27K, 2 watt resistor in this application.
Note 3. Some versions use 2.2Meg resistor in this application.
Note 4. In some versions, R52 and R53 are replaced by a single 22K, 4 watt resistor.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	RAULAND PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.95A	635VCT @.067A tap @ 415VCT @.049A	5VAC @ 2A SEC. 4 12.6VAC @.15A	6.3VAC @.3A SEC. 5 6.3VAC @5.2A	LP-0252					

TRANSFORMER (AUDIO OUTPUT)

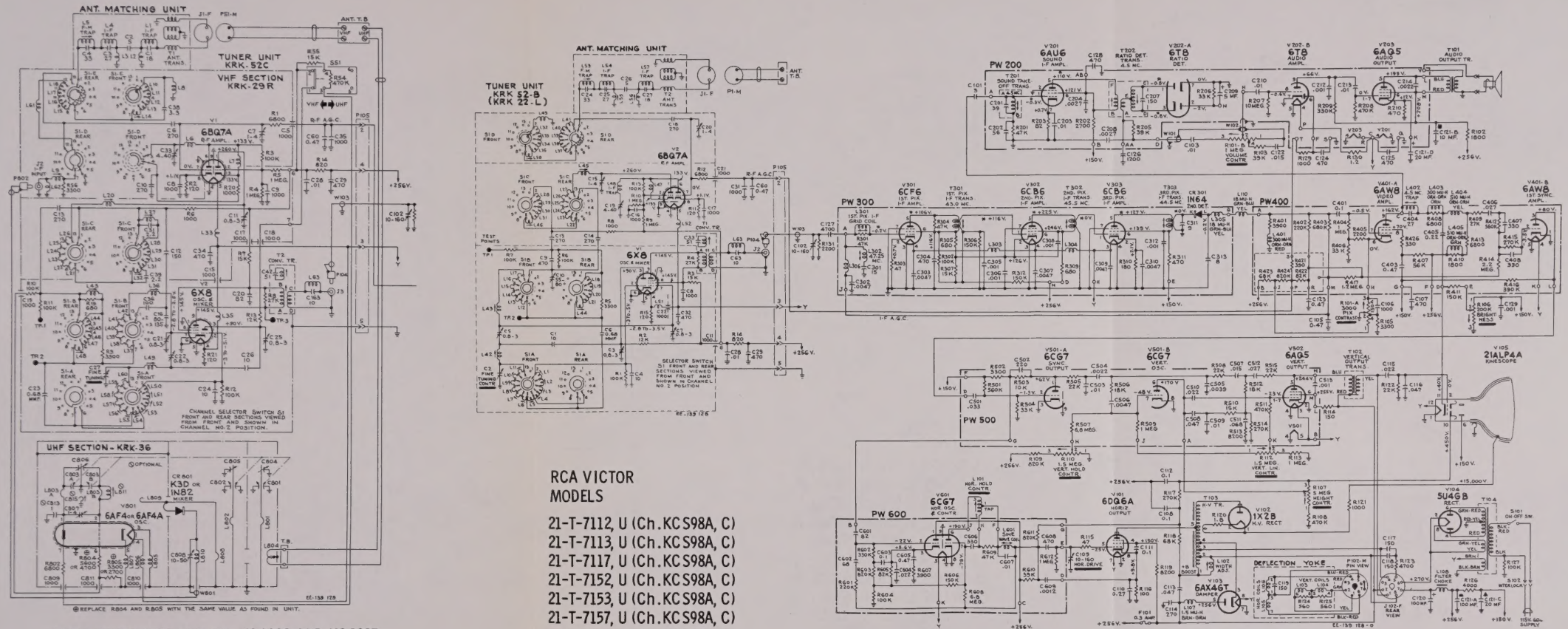
ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RAULAND PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8KΩ	16Ω tap @ 8Ω	LO-136-H	Z1404 ②③			22S66 ①④	S-24A ④③	① Tape 3.5Ω, 250Ω and 500Ω windings. ② Tape 4Ω windings. ③ Drill new mounting holes. ④ Tape 4Ω and 500Ω windings.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	RAULAND PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω		LW-0013				Tapped
L2	RF Choke	3Ω						3.3 Microhenries, IRC part #CLA
L3	FM RF Coil	0Ω		LW-0014				Tapped
L4	Fil. Choke	.3Ω						.68 Microhenry, IRC part #CLA
L5	Fil. Choke	.3Ω						.68 Microhenry, IRC part #CLA
L6	Fil. Choke	.3Ω						.68 Microhenry, IRC part #CLA
L7	FM Osc. Coil	0Ω	0Ω	LL-0058				
L8	AM Loop Stick	.4Ω		LW-0098				
L9	AM RF Coil	110Ω	6Ω	LW-0074				
L10	AM Osc. Coil	5.8Ω		LL-0049				Tapped @.5Ω
L11	1st. FM IF	.7Ω	.7Ω	LR-0032	16-3487	FM-254	1463	
L12	1st. AM IF	17Ω	17Ω	LR-0041	16-6758	BC-352	12-C1	
L13	2nd. FM IF	.7Ω	.7Ω	LR-0043	16-3487	FM-254	1463	
L14	2nd. AM IF	17Ω	17Ω	LR-0041	16-6758	BC-353	12-C2	
L15	Fil. Choke	.3Ω						.68 Microhenry, IRC part #CLA
L16	3rd. FM IF	.7Ω	.7Ω	LR-0043	16-3487	FM-254	1463	
L17	FM Limiter	.7Ω	.7Ω	LR-0043	16-3487	FM-254	1463	
L18	Fil. Choke	.3Ω						.68 Microhenry, IRC part #CLA
L19	Discriminator	.7Ω	10CT	LQ-0179	17-3494	FM-253	1464	

MISCELLANEOUS

ITEM No.	PART NAME	RAULAND PART No.	NOTES
M1	Pilot Light		#44
M2	Pilot Light		#44 Not used in some versions
M3	Dial Light		#47 AM Indicator
M4	Dial Light		#47 FM Indicator
M5	Tuning Cap.	CV-102B	6 Gang (AM Sections 21-430MMF, 21-420MMF, 15-185MMF)
M6A	Switch	X-0323	On-off (Power) SPST
B	Switch		Selector (Rotary, wafer type)
M7	Switch		Loudness (SPDT-Slide type)
M8	Meter		Tuning



TUNER SCHEMATIC FOR CH. KCS98C AND KCS98F

RCA VICTOR
MODELS

21-T-7112, U (Ch. KCS98A, C)
21-T-7113, U (Ch. KCS98A, C)
21-T-7117, U (Ch. KCS98A, C)
21-T-7152, U (Ch. KCS98A, C)
21-T-7153, U (Ch. KCS98A, C)
21-T-7157, U (Ch. KCS98A, C)
21-T-7352, U (Ch. KCS98E, F)
21-T-7355, U (Ch. KCS98E, F)
21-T-7357, U (Ch. KCS98E, F)

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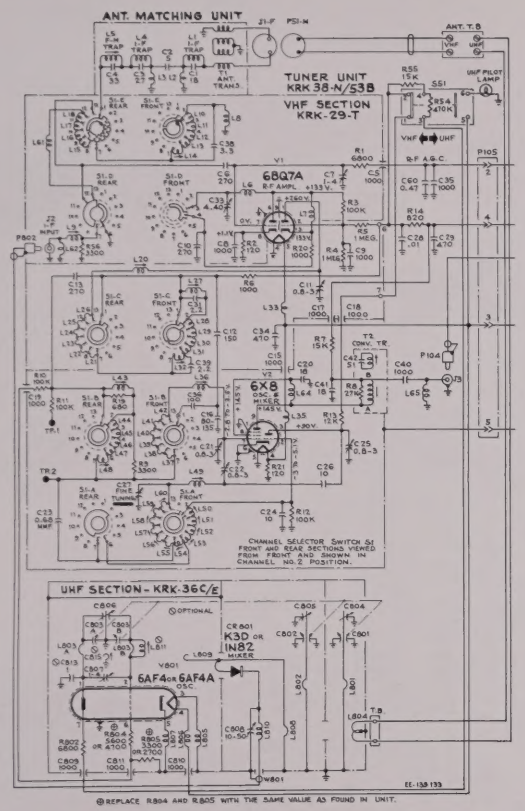
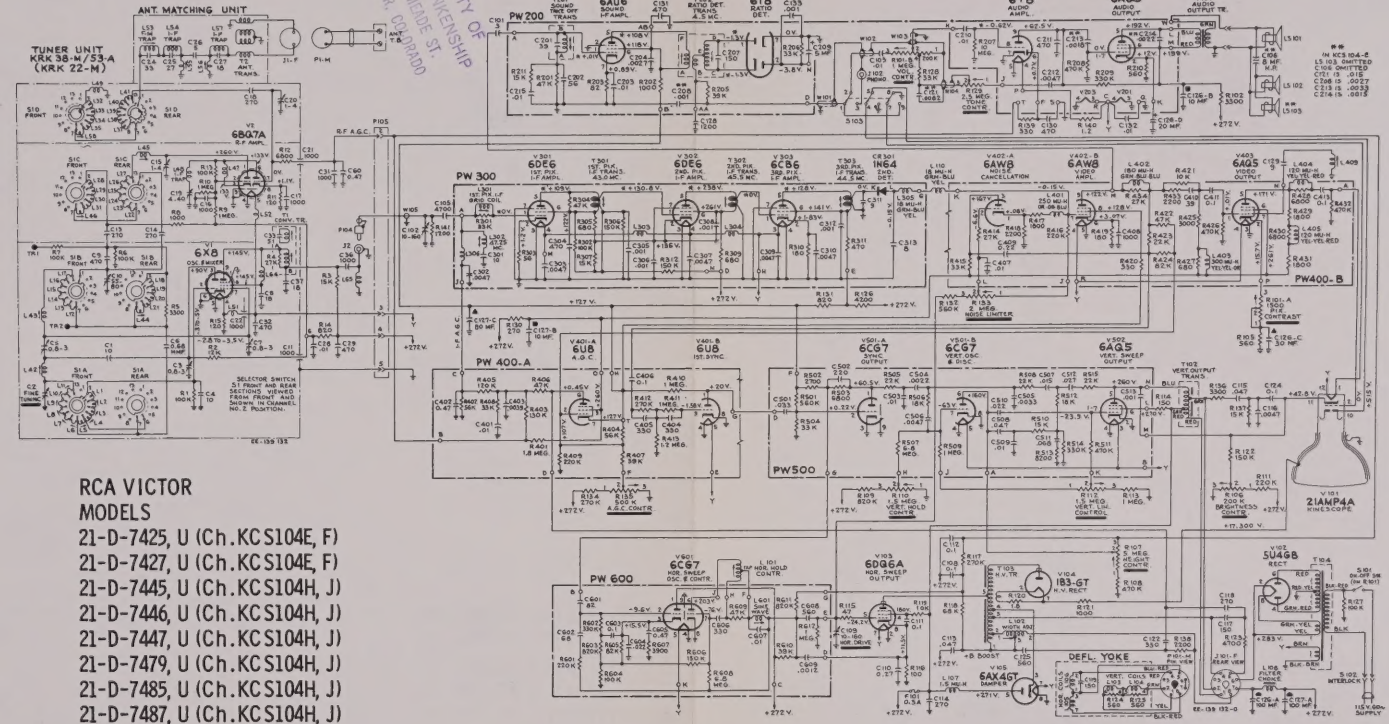
RCA VICTOR



TUNER SCHEMATIC FOR CH. KCS104F, KCS104J AND KCS104L



PROPERTY OF
L. F. BLANKENSHIP
3824 MERDE ST.
DENVER, COLORADO

RCA VICTOR
MODELS
21-D-7425, U (Ch. KCS104E, F)
21-D-7427, U (Ch. KCS104E, F)
21-D-7445, U (Ch. KCS104H, J)
21-D-7446, U (Ch. KCS104H, J)
21-D-7447, U (Ch. KCS104H, J)
21-D-7479, U (Ch. KCS104H, J)
21-D-7485, U (Ch. KCS104H, J)
21-D-7487, U (Ch. KCS104H, J)
21-D-7488, U (Ch. KCS104H, J)
21-D-7505, U (Ch. KCS104K, L)
21-D-7506, U (Ch. KCS104K, L)
21-D-7507, U (Ch. KCS104K, L)

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